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# MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—9TH YEAR.

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No. 10.

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## Table of Contents

	PAGE.		PAGE.
<b>ORIGINAL ARTICLES—</b>		<b>THE WEEK—</b>	
"The Pharmacy and Chemistry of the Australian Pharmaceutical Formulary," by R. C. COWLEY	259	Quinidine in Auricular Fibrillation	275
"Indications for Tonsillectomy in Children," by RUPERT M. DOWNES, C.M.G., M.D., M.S.	261	The Early Diagnosis of Diabetes	276
"Syphilis in Children," by H. BOYD GRAHAM, D.S.O., M.C., M.D.	265	Annual Meeting of the American Anæsthetists	277
"The Psychiatric Clinic," by RALPH A. NOBLE, M.B., CH.M.	269	The Welfare of Mothers and Infants	277
<b>REPORTS OF CASES—</b>		<b>ABSTRACTS FROM CURRENT MEDICAL LITERATURE—</b>	
"Chronic Intussusception," by HERBERT H. SCHLINK, M.B., CH.M.	270	Biological Chemistry	278
<b>REVIEWS—</b>		Physiology	279
Gastro-Intestinal Disorders	272	<b>BRITISH MEDICAL ASSOCIATION NEWS—</b>	
<b>PUBLIC HEALTH—</b>		Scientific	280
The Plague Outbreak	272	<b>MEDICAL SOCIETIES—</b>	
<b>NAVAL AND MILITARY—</b>		Melbourne Pædiatric Society	280
Appointments	272	<b>CORRESPONDENCE—</b>	
<b>LEADING ARTICLES—</b>		A Criticism of the Evidence Given by Dr. S. A. Smith Regarding Lead Poisoning Among Queensland Children	282
Pharmacology and Therapeutics	273	A Personal Matter	286
Stricken Europe	274	<b>VISIT TO THE CHEMICAL WORKS OF ELLIOTT BROTHERS, LIMITED</b>	
			286
		<b>MEDICAL APPOINTMENTS</b>	
			286
		<b>MEDICAL APPOINTMENTS VACANT, ETC.</b>	
			286
		<b>MEDICAL APPOINTMENTS: IMPORTANT NOTICE</b>	
			286
		<b>DIARY FOR THE MONTH</b>	
			286
		<b>EDITORIAL NOTICES</b>	
			286

### THE PHARMACY AND CHEMISTRY OF THE AUSTRALIAN PHARMACEUTICAL FORMULARY.<sup>1</sup>

By R. C. COWLEY,

*Director of the College of Pharmacy of Queensland.*

A LOCAL formulary has been found very useful to prescribers and dispensers in many districts throughout the British Empire where they are in use. They tend to define the particular drug or compound desired by the prescriber and to produce uniformity in the product dispensed.

Most young prescribers owe a great deal to the formularies published by the hospitals where they have been trained, but unless the dispenser knows where the prescriber has been trained, he is not able to select from the different hospital formularies the particular formula required, especially where several are similarly named.

The object of the Australian Pharmaceutical Conference in publishing this little book is to aim at uniformity in prescribing and dispensing unofficial preparations throughout the Commonwealth and in the Dominion of New Zealand.

Many manufacturing druggists in the British Isles and in America have taken advantage of the

short period of training in pharmacy now adopted by medical schools and have flooded the market with proprietary medicines of a kind that can easily be prepared by any competent pharmaceutical chemist. Several formulæ similar in composition to these preparations are included in the Australian Pharmaceutical Formulary and can with advantage to all concerned be substituted for advertised preparations. I will draw attention to several of them in the course of my remarks to-night.

It is a matter for regret that the Queensland Branch of the British Medical Association has taken no part in the compilation of the Australian Pharmaceutical Formulary. It is not difficult to draft a formula when one knows what the medical practitioner requires. I am of opinion that collaboration with the Queensland Branch of the British Medical Association would have had the effect of enhancing the value of the formulary. I trust that when a new edition of the Australian Pharmaceutical Formulary is found necessary, the Queensland Branch will share in its production.

It was thought fit to add only the shortest of therapeutic notes to each preparation. These are more of a suggestive nature than otherwise.

The list of chemical synonyms and trade names takes up a large portion of the book. During the period of the war this section was invaluable, as it enabled the prescriber and dispenser to eliminate

<sup>1</sup> Being an abstract of a paper read at a meeting of the Queensland Branch of the British Medical Association on November 4, 1921.

quite a number of chemical compounds of enemy origin. Now that the chemical markets of the world are becoming normal again, it does not appear that the same reasons exist for loading the book with many trade names of articles rarely employed.

I propose to discuss the most important of the Australian Pharmaceutical Formulary preparations:

#### **Diluted Hydriodic Acid.**

This compound is official in the British Pharmacopœia and has been introduced solely to give the pharmacists a simple method for preparing it, which is omitted from the Pharmacopœia. The last edition of the Australian Pharmaceutical Formulary contained a description of a syrup of hydriodic acid containing 1%, but that is now an official article. There is more than one proprietary syrup of hydriodic acid and as free iodine develops in all solutions of hydriodic acid, they may cause the pharmacist much loss if they are not rapidly used up. A good way of reconvertng the free iodine into hydriodic acid is to add a few drops of hypophosphorous acid, this compound being simultaneously oxidized into phosphoric acid. As the presence of hypophosphorous acid in hydriodic acid is sanctioned by the British Pharmacopœia, there does not appear to be any objection to this recommendation.

#### **Collodion Acetone.**

Collodion acetone can on the score of economy replace a proprietary article of a similar nature. It is easy of preparation.

#### **Mercurial Cream.**

The formula given in the Australian Pharmaceutical Formulary is a very satisfactory one from a pharmaceutical standpoint.

#### **Elixir of Calisaya.**

Pharmaceutically this formula produces a very elegant preparation, which can be recommended to medical practitioners who are in the habit of prescribing this class of article.

#### **Elixir of Cascara.**

I claim responsibility for this formula. It is widely known that cascara bark improves by age and some manufacturers store the bark for as long as five years before converting it into liquid extract. It does not appear to have been decided whether cascara bark contains an active glucoside or not, but I have always held the opinion that it does and that the ageing process referred to produces an alteration in the glucoside. Having this in mind, I endeavoured to hasten the ageing process by digesting the powdered drug in water containing an acid; the solution produced was neutralized with ammonia and evaporated; ammonia was added from time to time as the acidity returned. This finally produced a liquid devoid of taste, while the activity of the drug had considerably increased. I have received the unbiased opinion of several medical friends that the preparation is an eminently satisfactory one and that they prefer it to other cascara preparations. Dr. Martindale, in his "Extra Pharmacopœia," considers that the increased activity of cascara treated

in this way is due to the action of the acid on the resins present in the drug.

Elixir of diamorphine and terpin, compound elixir of glycerophosphates, compound elixir of pine and compound elixir of viburnum are all elegant preparations of their kind, capable of taking the place of highly priced proprietary articles containing similar ingredients.

#### **Milk of Magnesia.**

Proprietary lines containing magnesium hydroxide are widely advertised in America and one at least has found its way to Australia. I hold the opinion that Australian chemists are quite competent to meet all local requirements; hence the publication of the formula for this article.

Similar remarks apply to emulsion of cod liver oil and of paraffin and of an analgesic liniment. While I have no adverse comments to make on those products containing these substances which come from across the Pacific, as a good Australian I always advocate Australian products first, then British. Americans always seek for American articles when in Australia or anywhere else.

#### **Compound Liniment of Eucalyptus.**

In making this preparation advantage has been taken of the wonderful emulsifying property of ammonia soap, so that it can be made in a few minutes.

#### **Eusol.**

This has been introduced under the name of solution of hypochlorous acid. I recommend that eusol should be freshly prepared, as it deteriorates rapidly.

#### **Compound Solution of Bromo-Chloral.**

I am of opinion that physicians will welcome this formula and will prescribe an hypnotic they know all about rather than a proprietary article, about which they have to rely on the manufacturers' own statement. Pharmaceutically this is a very satisfactory production.

#### **Compound Solution of Cresol-Lysol.**

I claim responsibility for this formula for lysol. The formula had already been published in Australasian and English pharmacy journals. I have seen a similar formula published in American journals, with the claim that it is of American origin. The advantage this formula for lysol affords is that it can be prepared in a few minutes and without the use of heat.

Difficulty has been experienced during recent years in obtaining cresylic acid free from hydrocarbon oils and tarry substances, which in turn has made it difficult to prepare a lysol that would form a clear solution with water. That difficulty is being overcome. Still it behoves the pharmacist to test his cresylic acid for these impurities and to reject those samples which contain them.

#### **Compound Solution of Santal.**

Probably with the alteration in opinion on the correct treatment of gonorrhœa this article is no longer used so frequently as in former years. Most proprietary solutions of this kind are strongly alka-



line. The problem that had faced me in drafting the present formula was to produce a reasonably neutral preparation and one that would contain all the essential oils. This was overcome by adding to the mixed essential oils and copaiba a small quantity of olive oil and determining the saponification value of the mixture. Pharmaceutically it is an excellent preparation.

#### Ether Soap.

Ether soap was first prepared by a friend of mine in London, but since then it has been captured by the drug firms of the United States as the product of their country. It is easily and rapidly prepared by the formula given; but even this formula could be simplified were the editors of the Australian Pharmaceutical Formulary sure that every practising pharmacist had the command of a laboratory. There is not quite the same proportion of ether in the preparation that is found in most published formulæ, owing to the prevailing high temperature of the Australian summer.

I question whether an alcoholic solution would not be equally serviceable. An oleic acid soap produces a frothy lather. To obtain a creamy lather from a soap it must contain salts of fatty acids of high melting point, such as stearic acid. But soaps containing stearates are not particularly soluble in ether. I can recommend a mixture of two parts of oleic acid and one part of stearic acid in alcoholic solution neutralized with potash. A soap solution containing 22% to 24% and one that will produce an excellent lather can be made with equal volumes of alcohol and water.

#### Dakin's Solution (Solution of Sodium Hypochlorite).

While the solution of chlorinated soda of the British Pharmacopœia has long been used in the treatment of unhealthy wounds, it has the disadvantage that it is strongly alkaline. During the war I conducted a series of experiments with the object of eliminating this objection. My results have been published in THE MEDICAL JOURNAL OF AUSTRALIA. Though the formula then published gave an excellent product, it was too unwieldy for every-day use. In the Australian Pharmaceutical Formulary formula Dufresne's method of removing free alkali has been adopted, viz., some sodium bicarbonate is added to take up the caustic alkali:  $\text{NaOH} + \text{NaHCO}_3 = \text{Na}_2\text{CO}_3 + \text{H}_2\text{O}$ . The action of Dakin's solution depends on the liberation of oxygen from it when brought in contact with necrotic tissue, but not on chlorine as is popularly supposed to be.

#### Compound Solution of Thymol.

The dentists of Brisbane have found this useful as a mouth wash and prescribe it freely for that purpose. It is quite pleasant to use.

#### Pepsin and Bismuth Mixture.

It is most essential that this mixture should be free from alkalinity, since free alkali of any kind will destroy pepsin completely. One proprietary article was found to be intensely strong in free ammonia. The solution of bismuth is the stumbling block. In my opinion *liquor bismuthi* should always be neutral. It is not difficult to obtain it so. When

prescribed with sodium bicarbonate a precipitate will form at once if *liquor bismuthi* contains free ammonia, but if neutral a precipitate will not form for several days. I regard this as the correct way to dispense such a mixture. An objection to the formula of bismuth and pepsin mixture is the colouring matter, which is readily affected by light and heat. Prescribers, therefore, should not be too hasty in expressing their opinion on the accuracy of the dispenser when they see the product somewhat different in colour on different occasions.

#### Parogens.

The basis of the parogens is a mixture of ammonia soap with liquid paraffin. They will form emulsions with water and can be prepared very rapidly. Several of them, particularly analgesic parogen and iodine parogen, are often prescribed. The latter compound will leave no iodine stain when well rubbed into the skin.

#### Bismuth and Iodoform Ointment (B.I.P.P.).

For convenience of both medical man and dispenser it was thought fit to introduce a formula for this well-known ointment. It is too well known to call for any comment.

#### Stainless Iodine Ointment.

This formula is the result of experiments by an Australian pharmacist. Since its publication in the *Australasian Journal of Pharmacy*, it has been copied into almost every pharmacy journal throughout the English-speaking world. It is to be recommended whenever this class of preparation is desired.

Compound menthol ointment, compound resorcin ointment, resorcin and bismuth ointment, all have their equivalents in the form of proprietary articles, but as their formulæ are set forth in the Australian Pharmaceutical Formulary, it should appeal to the prescriber's self-respect to indicate them rather than to select a product of a manufacturing firm whose interest it is to conceal the formulæ of their preparation.

#### INDICATIONS FOR TONSILLECTOMY IN CHILDREN.<sup>1</sup>

BY RUPERT M. DOWNES, C.M.G., M.D., M.S.,  
Out-Patient and Temporary In-Patient Surgeon,  
Children's Hospital, Melbourne.

As long as the popular operation on the tonsils in children was a partial tonsillectomy by guillotine, only those tonsils visibly enlarged were, as a rule, subjected to operation. With the more general adoption in the last three or four years of the method of total enucleation by means of reversed guillotine all kinds of tonsils are removed.

It struck me on returning to civil practice that war had been declared on tonsils in so far that almost every child with symptoms referable to the nose or pharynx seemed to be sentenced to lose its tonsils.

Being disinclined to perform tonsillectomy on

<sup>1</sup> Read at a meeting of the Melbourne Pædiatric Society on April 13, 1921.

every child who required removal of post-nasal adenoids, I examined the tonsils of each critically, but soon found that I did not know which of the many varieties of tonsils were pathological. Accordingly, I decided to note carefully the history and tonsillar appearance in a series of cases and to examine microscopically sections from the different types in the hope of arriving at definite conclusions as to the types that betokened definite pathological changes. Though no great information has resulted, this inquiry has been of considerable benefit to me. I am presenting the conclusions to-night in the hope that they may be of some use to others and with the object of promoting a free and quite critical discussion.

#### Signs and Symptoms.

It is sometimes taught that if there be hypertrophy or an infective condition of any one of the three lymphoid bodies composing Waldeyer's ring in children, all of them will be affected. In many cases I do not think this is correct; but in the majority of children in whom the question of tonsillectomy arises, signs and symptoms due to post-nasal adenoids are present and must be considered together with those of tonsillar origin.

For the purposes of this paper I have examined and noted the histories of one hundred consecutive children who were subjected to operation in the out-patient department of this hospital.

The symptoms and signs can be conveniently considered in three groups:

Firstly, from obstruction to the airway we have snoring and mouth breathing. According to the parents' accounts, either or both of these symptoms were present in 95%, some 14% who did not snore being mouth breathers. These figures may be a little in error, for the parents are often quite hazy as to either symptom and indeed in slight cases it is often difficult to decide whether a child is snoring or not. The statements of a few that, while the child snored, it slept with its mouth closed, must, however, be incorrect. In this group I should include restlessness and night terrors, though, of course, they may have other causes not referable to the naso-pharynx. Of the children, 73% had one or other of these symptoms and in the 57% who slept restlessly, the mothers generally were very much alive to this abnormality. The classical post-nasal facies may also be taken in this group; it was noted in 30%. Routine examination of the nose for possible causes of obstruction therein was not carried out, partly on account of difficulties with regard to lighting and partly because children resent and are easily frightened by a nasal speculum, rendering examination without an anæsthetic difficult. It was done in special cases and in five of this series antral disease was found. It does not appear to me that the tonsils can have much effect in blocking the airway, except perhaps when they are very large and meet in the middle line. I should place no weight on these symptoms in deciding the need for tonsillectomy.

In the second group are the symptoms of earache and deafness, which were complained of by 50% and 45% of the children respectively. There are decided fallacies in these figures, for the earache, as well

as being due to *otitis media*, may be the result of furuncle or the referred pain of carious teeth and in an out-patient clinic the children are not often seen while the pain is present; a history of aural discharge is far less frequent. Deafness, on the other hand, is probably under-estimated from lack of observation on the parent's part and the difficulty of testing it in small children. The tonsils alone are not likely to be the cause of either of these symptoms.

Before coming to the last group, there are three other conditions requiring mention that cannot be placed in any of the groups. Epistaxis occurred in only 14% of the series and has little value in the question of operation. Frequent colds in the head were mentioned in 76%, but as no child escapes some attacks of coryza and as what constitutes "frequency" must be so variable a factor, this figure means little. Differences in environment and resistance to the organisms of coryza are so variable that they add to the unreliability of this figure; there is no doubt, however, that an unhealthy condition of the oral and naso-pharyngeal cavities predisposes to frequent "colds."

The question of the enlargement of the cervical glands as a diagnostic sign of tonsil or post-nasal infection is open to discussion and the reliance placed on any enlargement must be largely a matter of individual opinion. The difficulty is to say in most cases what are normal and what are enlarged glands, for in an out-patient department it is quite the exception to find a young child who has not definitely palpable cervical glands and, strangely, some of the few in whom they are not palpable have obvious signs of unhealthy tonsils. In this series of children, 95% had palpable glands and only in seventeen could the glands be described as small; that is, 78% had glands that were quite large; some were very large and aroused a suspicion of tuberculosis. There is a gland at the anterior margin of the sterno-mastoid at or just below the angle of the mandible which has been called the tonsillar gland, enlargement of which is said to be pathognomonic of tonsillar infection. I cannot agree with this, for this gland is never enlarged apart from other glands of the cervical chain, nor is it ever non-palpable when there is a generalized enlargement of the cervical glands. It certainly is sometimes larger than the other glands, but as the lymphatic drain from the naso-pharynx is eventually into the same chain of glands as that from the tonsils, little reliance can be placed on its enlargement as an indication of tonsillar infection. Of course, other sources of infection, such as the teeth, ears and skin of the head, face and neck, as well as diseases of the lymphatic system, must be excluded before giving diagnostic weight to enlarged glands. With this exclusion, I think only markedly enlarged glands can be taken as a diagnostic sign of tonsillar or post-nasal infection and, whatever may be the case in adults, in children no general inference as to tonsillar apart from post-nasal infection can be drawn from them.

The third group of symptoms and signs concerns the tonsils alone. I look on a history of sore throats as of the utmost importance in deciding for or against tonsillectomy. It is not always a simple

matter to get a clear statement about it from parents; a good deal of cross-examination is sometimes necessary, especially to ascertain if the sore throats are merely part of attacks of coryza or quite separate. It is probable, however, that the mistaken statement that the child does not suffer from sore throat is much more frequent than the statement that it does. The difficulty of deciding if a small child has a sore throat, when it is unable to tell you so, is sufficient reason for this, apart from the frequent lack of observation in parents. On the other hand, it is not uncommon for the mother to describe the "ulcers" she has seen on the child's tonsils; these are usually patches of exudate. Then there is often a medical man's previous diagnosis of tonsillitis or the child on examination may have obvious signs of so-called "follicular" tonsillitis. In this series a history of sore throat was obtained in 60%.

#### Examination of the Throat.

With regard to examination, it is preferable to use a head mirror; the child must be kept still and more than a cursory glance at the tonsils is necessary.

The following are the main points to be noted, the significance of which will be discussed later. The size of the tonsil is important, but it must be remembered that part of it is buried and is not visible. The proportion of the buried to the uncovered part is very variable, so that it is not infrequent to find a tonsil apparently but little enlarged, actually larger on enucleation than one that appeared very large before operation. In the former case the greater part of the tonsil was hidden in the pharyngeal wall, while in the latter the greater part lay uncovered. The action of the pharyngeal muscles, too, affects the apparent size; when they contract, as in "gagging," the tonsil is pushed inwards and more of it becomes visible. It seems to be the custom, however, to speak of any tonsil in a child as enlarged that protrudes beyond the pillars of the fauces. While it is difficult to have any fixed standard, I think this is an unreasonable one. Some tonsils are so large that they meet in the middle line and they are obviously enlarged, however little lies hidden. Of more importance as an indication of disease is a difference in size between the two tonsils or a decrease observed at a subsequent examination, due to resolution of inflammation not apparent when first seen.

The points to be noted in regard to the appearance are the presence or absence of the openings of the crypts, the occurrence of fissures or loss of the normal contour constituting irregularity, any visible blood vessels, any spots of pus in the cryptic openings or surface exudate and any inflammatory appearance in the peri-tonsillar tissues. All combinations of enlarged or apparently unenlarged tonsils with these different surface appearances are found; in more than half my cases, however, the tonsil had an irregular surface.

#### Pathological Histology.

Sections of thirty-seven tonsils have been examined. These include several of each of the macro-

scopic types I have seen. It would be very simple if each of the different types of tonsils were found to have a definite and distinct histological appearance to fit it; but this is not so. The changes observed are not very notable and, except in a small number where acute or sub-acute inflammation is present in the parenchyma (none of the latter presented macroscopic signs of acute inflammation at the time of operation), it is the crypts and their ramifications almost exclusively that show signs of disease. It is far from easy to distinguish in these slides the pathological from the normal and to determine to what extent the tissue is affected. I have had to go over them all repeatedly before I could formulate a definite conception of their relative pathogeny. It is quite apparent, consequently, that there may be considerable difference of opinion in the interpretation of these sections.

At the outset, one is confronted by the difficulty of saying what is the appearance of the normal tonsil. None of the text-books of pathology that I have been able to consult, have been of the slightest help; very little is to be found in histology text-books either. Barnes, in his monograph on the tonsil, considers the histology minutely, but I believe some of the appearances he describes as normal are not so. As already mentioned, it is on the crypts that attention must be focussed, as regards their contents and walls. In no case did careful search fail to disclose some contents in the cryptic ramifications, but in nine there was very little; in the remainder there were definite collections of varying degree. The nature of the contents varies; it includes amorphous debris and polymorpho-nuclear leucocytes, whole or fragmented for the main part, lymphocytes in lesser degree, though sometimes they are the only cells. In the marked case there is a great increase in the ramifications of the crypts and many cut transversely appear like small abscesses, but their nature is always shown by a distinct epithelial wall; sometimes the pus appears very old.

It is held by some that the crypts always contain some debris and probably this is so. It seems likely that the normal debris will not contain more than a few stray lymphocytes and detached epithelial cells, while collections of polynuclear leucocytes or much nuclear fragments must assuredly be pathological. It may be difficult to decide in individual sections and it is certainly open to argument whether any debris is normal, even when it only contains lymphocytes—the so-called salivary corpuscles.

I believe that the walls of the crypts more particularly give information as to the pathological state of the tonsil. In many sections crypts can be traced from their mouths, where the walls consist of a number of rows of cubical epithelial cells, through the gland substance towards the capsule. In their course the epithelium changes considerably in character, soon becoming only one or two layers thick, while the cells themselves are elongate or flattened, so that they are not easy to distinguish. At intervals the number of layers of the walls may temporarily increase and frequently at the ends of diverticula from the main crypt there is a distinct increase in thickness of the wall.



Barnes states that the epithelium of the crypts is normally made very irregular with finger-like out-growths through invasion of the wall by lymphoid tissue, with a return to the unbroken condition after puberty. With this I strongly disagree and look on these finger-like out-growths as the one characteristic by which the degree of abnormality is to be judged. The reasons for thinking so are, first, that these out-growths into the lymphoid tissue are not present in all tonsils examined, nor are they present throughout the cryptic ramifications in even the most marked cases. Then they sometimes extend to a far greater depth from the lumen than does the epithelium covering the oral surface of the tonsil where it is separated from the lymphoid tissue by a layer of connective tissue. Furthermore, these out-shoots are most wide-spread and longest in those cases where there is a quantity of pus throughout the cryptic lumina. I look on the typical histological appearance of a marked case of chronic tonsillitis as that of an extensive system of tortuous, pus-filled, cryptic diverticula with longish and wide-spread epithelial out-shoots into the lymphoid tissue. Surely it is reasonable to regard these out-shoots as the results of irritation by the organisms that are the cause of the pus in the crypts. In all but four of the sections examined there were distinct out-shoots in some parts of the crypts, either localized or wide-spread. The epithelial out-shoots are of peculiar nature; they mostly appear as strands of elongated cells, one, two or three layers thick, with oval or spindle-shaped nuclei. Frequently in the section they are so cut that they appear to be detached from the wall of the crypt and are then indistinguishable from the fibroblasts of new connective tissue. At first I looked on them as such, but after recognizing their frequency and noting that they always appeared close to out-shoots continuous with the crypt walls, I came to the conclusion that they were all epithelial cells squeezed flat by the surrounding lymphoid cells. In none of the sections is there any other appearance of early fibrosis. As regards the question of increase of fully formed fibrous tissue strands the great variation in the size of the trabeculae from the capsule makes it very difficult to say in any individual case whether there is an increase of fibrous tissue.

In a few sections polymorpho-nuclear cells were seen in the epithelial covering of the tonsil and the mouths of the crypts; in one case in which exudate was present a week before operation, there was a great determination of polynuclear leucocytes to the surface layers, so that they practically formed a layer of pus obscuring the epithelial cells, with but few in the deeper layers. Barnes speaks of the presence of polynuclear cells in the epithelium as a normal condition, but the infrequency of this appearance and its association with macroscopic signs of inflammation renders such a contention improbable.

Though showing no signs of acute inflammation at the time of operation, ten of the specimens revealed them in varying degrees microscopically. They varied from a few small patches, generally around the crypts or towards the epithelial surface,

to a complete involvement of the whole gland, which tended to obscure the details of cryptic irritation. Only one instance was noted in which the characteristic collection of pus in a crypt had spread beyond the cryptic wall.

Vascular thickening does not figure prominently in these sections. Four only showed marked thickening, while seven were slightly affected. It was noted that the peri-tonsillar vessels might be thickened, while the tonsillar vessels were not and *vice versa*.

Three tonsils examined were definitely tuberculous; they showed also a marked condition of cryptitis and were associated with tuberculous cervical glands too.

#### Indications for Operation.

This investigation was begun with a hope that it would demonstrate that many of the tonsils removed nowadays were not pathological. If the microscopical appearances of what may be called cryptitis, that is, numerous irregular sections of crypts containing multiple pus foci with streamers of epithelial cells invading the lymphoid tissue, is definitely a pathological condition, as I believe, then but few of these tonsils can be considered healthy. There were certainly some, however, in which the cryptitis was so slight that the tonsil was practically normal.

#### Conclusions.

As already mentioned, the histories and signs, generally speaking, did not dovetail with the pathological histology and it has taken considerable analysis to correlate them. A consideration of the clinical picture and section of each case would be tiresome, so the conclusions merely will be presented.

First in importance is the history. If this clearly shows recurrent attacks of sore throat reasonably attributable to the tonsils, then they should be removed. If the child has had only a single sore throat in the absence of definite signs, operation may well be postponed until further attacks occur.

A "negative" history is not so valuable, for in more than half of such cases on examination or microscopical section appearances that could hardly have existed without the accompaniment of pain, were discovered.

The tonsillar appearance most characteristic of disease is that of irregularity. Here all or part of the epithelial surface shows small granulations and is usually paler than normal; or fissures and irregular holes considerably larger than the normal cryptic openings may be seen with or without pus and debris. In some cases a transverse cleft is seen, which merely marks the division between the two lobes of the tonsil that obtains in the foetus, but usually disappears before birth. This, of course, is to be ignored, except as regards operative significance. Instead of irregularity there may be an abnormal smoothness of the surface, with absence of cryptic mouths, but the same palish colour. When this appearance is noted, the presence of sub-acute inflammation, which was found in about 60% of this type sectioned, may be suspected. The majority of



such tonsils are not enlarged and are sometimes difficult to see.

The prominent rounded or oval openings of the crypts, like miniature shell-holes, are a normal appearance and it is their absence that is pathological. If they show even minute spots of pus, it probably indicates collections of pus in the deeper parts, especially close to the capsule.

I do not think the appearance of a few vessels on the surface, which is quite frequent, has any pathological significance.

We usually obtain a truer indication for operation from any of these abnormal appearances than from apparent enlargement. I do not think removal should be carried out on account of size alone. The most unpathological section I have is from a tonsil that touched its fellow, but was otherwise normal and lacked a history of tonsillitis. On the other hand, very large tonsils should be regarded with suspicion, especially if they diminish while under observation; they will not do so, if merely hypertrophied and not inflamed.

What, then, is the appearance of a normal tonsil? I should say it is that of one which lies within the pillars of the fauces or projects a little beyond them, with an even contour broken only by the shell-hole cryptic openings that exude no pus. Its colour varies a good deal in individuals. Nevertheless, I should not hesitate to remove such a tonsil with a definite history of repeated sore throats referable to the tonsil.

There are other indications for tonsillectomy which will only be mentioned:

(i.) With tubercular cervical glands they should be removed, as in such cases the tonsil is so frequently tuberculous or the home of the tubercle bacillus.

(ii.) In cases of chorea or rheumatism good results sometimes follow tonsillectomy.

(iii.) It may be necessary to clear up a diphtheria carrier or advisable in repeated attacks of diphtheria.

(iv.) In some joint conditions. I have recently had two patients who appeared to be suffering from early tuberculous disease of the hip, but X-ray examination failed to confirm the diagnosis and the joint symptoms cleared up after enucleation of the tonsils.

In conclusion, though it seems that the majority of children who present symptoms of post-nasal adenoid vegetations, have unhealthy tonsils, I should urge that each case be carefully examined and considered before tonsillectomy, rather than that the operation be performed as a routine, as is so often the case. Apart from the considerable pain and discomfort which a child so often suffers after this operation (much diminished if Redpath's guillotine be used) it surely is not logical to remove unnecessarily an organ of whose function we are not quite sure.

I am much indebted to Mr. A. T. Adams, who has prepared all the sections, and to Dr. Reginald Webster, who has helped me greatly by his advice and criticism.

## SYPHILIS IN CHILDREN.<sup>1</sup>

By H. BOYD GRAHAM, D.S.O., M.C., M.D. (MELB.),  
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At the request of members of the Honorary Staff of this Hospital, the technique will be described which is usually employed by resident medical officers when administering nov-arseno-billon, together with the results in a series of the injections and the Wassermann findings that are available and, in addition, a brief analysis of some family histories.

The seventy-six cases investigated are those of all the children that have been given injections by me and all the injections that they have had are included.

### Technique of Deep Subcutaneous Injection.

The aim is to introduce a concentrated aqueous solution of nov-arseno-billon under the ilio-tibial tract of the *fascia lata* and the underlying sheath of the *vastus lateralis* muscle by deep subcutaneous injection through the skin over the lateral prominence of the thigh below the great trochanter.

It is found necessary to sterilize two large enameled basins, three small ones, a flat-bottomed tray and a receptacle for swabs, a towel or two, some strips of gauze long enough to encircle the thigh, a few small swabs of wool, a pair of swab-holding forceps and a pair of bowl-holding forceps.

A two cubic centimetre hypodermic syringe with a glass barrel, a very small graduated cylindrical glass measure with a flat base, a small glass beaker and a short glass stirring rod are sterilized by immersion in antiseptic lotion in one of the large basins and are then transferred to the other large basin, in which they are thoroughly rinsed in sterile water before being placed on the tray. Then the beaker is filled with sterile water.

Some needles of medium bore and length, which fit the syringe, are sterilized by boiling.

In one of the small basins, the ampoules of nov-arseno-billon and the file supplied with them are immersed in methylated spirits, tincture of iodine is poured into another and the third is for used swabs.

The towels, gauze and swabs before use are placed in the receptacle for swabs.

It is convenient to have the child lying on the opposite side to that selected for the injection and firmly held by the assistant in such a way that there is no danger of sudden movement of the patient's leg.

The surgeon sterilizes his hands and swabs the exposed thigh with iodine, surrounds the site with a sterile towel and proceeds to prepare the injection.

A sealed ampoule, which contains 0.6 grammes of nov-arseno-billon, and the file are taken out of the spirits and washed in the basin of water and the ampoule is opened with the file. The contents of the ampoule are tapped into the small glass measure and the syringe is used to draw up one cubic centimetre of water from the beaker. This water is added

<sup>1</sup> Read at a meeting of the Melbourne Paediatric Society on November 9, 1921.

to the powder and, as solution is not instantaneous, the stirring rod is used. It is found that the clear yellow fluid ready for injection measures approximately 1.3 cubic centimetres.

A needle is fitted securely to the syringe and the required dose is drawn up.

With the thumb and forefinger of the left hand the skin and subcutaneous tissues are lifted up and transfixed at an angle of about 60° by the needle of the loaded syringe.

As soon as it is felt that the aponeurosis has been pierced, the piston of the syringe is slowly pushed home and the needle is withdrawn. Care should be taken not to inject any air.

The tissues held by the left hand are released and the site is painted with iodine and covered with a strip of gauze.

Instructions are issued that half an hour later the gauze is to be removed and the thigh is to be massaged for ten minutes by passing the hand firmly over it in the direction in which the injection was made. This massage is to be repeated once or twice during the ensuing twenty-four hours. If the patient is old enough to do so, walking is to be encouraged.

#### Discussion of Technique.

The choice of a suitable site was decided after trying injections into the extensor surface of the upper arm, the abdominal wall, the flank, the muscles of the back and the buttocks. It is suggested that the movements of the leg in walking and the anatomical arrangement of the ilio-tibial band are factors which provide natural massage of the injected fluid and materially assist absorption. Moreover, the injected fluid is distributed over a wide area.

In practice, the depth of the injections varies and in some cases it is difficult to decide when the point of the needle has passed through the potential space between the aponeurosis and the muscle fascia. Some of the injections were intramuscular and it has been noticed that these are liable to cause pain and disinclination to walk or even actual limping for a day or more. Superficial injections, especially in poorly nourished subjects, are likely to result in induration and tenderness, with a tendency to encapsulation or, if infected, to abscess formation.

The ampoules are placed in spirit so that they can be handled by the surgeon when preparing the injection at the last possible moment, thereby avoiding undue exposure of the fluid. Further, a crack in the glass, if present, would be detected and the ampoule would not be used.

A fine needle through which it is at all difficult to force the solution, would upset calculations of the resistance offered by the tissues. Estimation of this resistance is helpful in localizing the depth of the point of the needle. In this connexion it may be mentioned that a short bevel is preferable to a long one on the needle selected.

The solution is not prepared in the barrel of the syringe, because it is simpler to use the small measure. Economy must be studied and waste eliminated when using a solution that costs three pence a drop.

Accuracy in dosage and absence of wastage can be attained by following the outlined technique, which is presented in detail to show that there are no subtleties to militate against its use in private practice.

It is not claimed that this technique is original. It is merely a modification of that ascribed by Colonel Harrison<sup>(1)</sup> to Wechselmann and Major White.

#### Results.

Most of the injections have been painless and the patients have not had the slightest inconvenience. They are brought along by their parents voluntarily for further injections.

In 403 injections sixteen abscesses have occurred, affecting thirteen children out of seventy-six. These abscesses have been differentiated into two types. One type is associated with swelling, redness, heat and pain, for which the obvious treatment is incision and drainage in the early stage, if possible. They may take as long as two months to heal. The other type is less severe, without inflammatory signs, and may be aspirated through sound tissue. The fluid thus obtained is black and thin and chemical change in the injected fluid may have occurred similar to that which takes place when the fluid or the powder is exposed to air for any length of time.

The more important prophylactic measures against abscess formation are believed to be sterilization, massage, absence from the injected fluid of irritant disinfectant lotions and correct site and depth of injection.

The other incidents, twenty-four in number, such as induration, pain and stiffness, are of relatively slight importance, but are regrettable, as their occurrence is likely to affect the goodwill of the patient. On one occasion a needle was broken; this illustrates the value of paying attention to the way in which the child is held by the assistant.

The interval between each of six successive injections has usually been seven days. Those patients who have had more than six injections have had more than one course, with a varying period between courses.

Dosage has been rather high. The average dose for the series is 0.33 gramme. That for eighteen babies under twelve months old, who have had seventy-one injections between them, is 0.28 gramme. The largest dose, 0.6 gramme, has been given four times, 0.5 gramme eight times and 0.4 gramme nineteen times to these babies, many of whom were only a few weeks old, without any untoward result.

Dr. Leonard Findlay, of Glasgow, in his contribution to a recent discussion on congenital syphilis is reported<sup>(2)</sup> to have stated that treatment by mercury alone is condemned, the mortality rate under three months being given as 71%. Comparing the early days of post-natal treatment with salvarsan and mercury, he points out a great reduction in mortality rate under three months, the figure given being 37%. Another speaker, Mr. John Adams, places arsenic first in the treatment of congenital syphilis as "the great rescuer from early death."

### Summary of Results of Injections.

	Age Groups.				
	(1) Under 1	(2) 1 to 2	(3) 2 to 8	(4) 8 to 14	(5) Under 14
Total Number of Patients .. . . .	18	6	22	30	76
Number of Patients (Uneventful Injections) .. . . .	14	5	14	21	54
Number of Abscesses .. . . .	4	1	5	3	13
Total Number of Injections .. . . .	71	24	128	180	403
Uneventful Injections .. . . .	62	21	119	161	363
Percentage of Uneventful Injections .. . . .	87%	87%	93%	89%	90%
Average Number of Injections .. . . .	4	4	5.5	6	5.3
Incidents of Injection—					
Induration .. . . .	3	2	2	11 <sup>1</sup>	18 <sup>2</sup>
Stiffness or Pain .. . . .	0	0	0	4	4
Vomiting .. . . .	0	0	0	1	1
Broken Needle .. . . .	0	0	1	0	1
Abscess .. . . .	6	1	6	3 <sup>1</sup>	16 <sup>1</sup>
Average Dose in Grammes .. . . .	0.28	0.35	0.32	0.36	0.33

As special skill is required to administer arsenic intravenously in these cases, the deep subcutaneous method is regarded as more generally applicable, in spite of the risk of abscess formation.

#### Wassermann Findings.

It is outside the scope of this paper to investigate the efficacy of arsenic in the treatment of syphilis and no special effort has been made to obtain blood specimens after injections.

In this series twenty-five patients whose serum yielded Wassermann reactions before injections were given, have been tested afterwards. A reaction was obtained in five of them after 2.5, 3.25, 1.7, 2.7 and 1 gramme respectively. In eight cases no reaction was obtained and in the remaining twelve cases the response was regarded as partial.

Of nineteen mothers of unquestionably syphilitic children, eighteen gave Wassermann reactions, illustrating that it is an aid to diagnosis in a doubtful case to have the mother's blood tested.

<sup>1</sup> One in buttock.

<sup>2</sup> Seven in experimental sites.

#### Family Histories.

There were 169 pregnancies in thirty-two families, one only in each of eight of them; they resulted in the birth of 116 children, of whom twenty-eight died in childhood, twelve in the first month. Of the eighty-eight living children, forty-one are known to be syphilitic, four are probably syphilitic, four have no stigmata and their serum does not yield a Wassermann reaction and thirty-nine, not examined, are said to be well. Of these thirty-nine, twenty-one are believed to have been born before syphilis entered the family. In addition, there are admitted thirty-one miscarriages and abortions, nine of them self-induced by the mothers, and twenty-two still-births.

Family No. 16 illustrates to an extreme degree the havoc caused by syphilis. Out of eleven pregnancies, only four children survived the first year, three of whom have manifest syphilis. The youngest child has had consistent mercurial treatment for four years and still has ill-health; its serum gives a Wassermann reaction.

By obtaining details, as in Family No. 4, the date at which syphilis entered a family can sometimes be approximately fixed. This has a definite value in diagnosis in a doubtful case. Further, the

#### Family No. 16.

Mother Positive; Treated four years					Father Not examined				
Twins	Died	Died	F. 19	F. 18	Misc.	Died	Died	F. 12	Misc.
Still-born	12 hours	12 hours	Negative;	Positive;		6 months	10 months	Negative;	
			no stigmata	untreated				treated;	
			by injections;	interstitial				keratitis	
			keratitis						
									F. 4; Positive; treated

#### Family No. 4.

Mother					First Husband					Second Husband	
M. 19	M. 17	F. 15	M.	M. 12	F. 9	Still-born;	Still-born	Still-born	Still-born	F.	M.
Well	Well	Well	Died	Well	Well	premature	born	born	born	Died	5 weeks;
			15 months			(7 months)				4½ months	syph-
			? diphtheria							gastro-	ilitic
										enteritis;	negative

## Syphilitic Family Histories.

Family Num- ber.	Children.									Mis- car- riages and Abor- tions.	Approximate Time at Which Syphilis Entered the Family.
	Living.	Examined.			Not Examined.		Dead.	Stillborn.	Died in First Month.		
		Positive.	Doubtful.	Negative	Healthy.	Well.					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	3	1	—	—	—	2	2	—	2	—	At marriage
2	1	1	—	—	—	—	—	—	—	—	At marriage
3	3	1	1	—	—	1	1	—	—	2	At marriage
4	6	1	—	—	5	—	2	5	—	—	Eight years ago, after five children
5	1	1	—	—	—	—	—	—	—	—	At marriage
6	1	1	—	—	—	—	—	—	—	1	At marriage
7	3	1	—	—	—	2	1	—	—	—	At marriage
8	7	1	—	—	6	—	—	—	—	—	At second marriage
9	1	1	—	—	—	—	—	—	—	—	Unmarried mother
10	1	1	—	—	—	—	—	—	—	—	At marriage
11	2	1	1	—	—	—	1	—	—	—	At marriage
12	3	2	1	—	—	—	1	—	1	—	At marriage
13	6	1	1	—	—	4	2	—	—	1	Doubtful
14	3	1	—	—	2	—	—	—	—	—	At second marriage
15	2	2	—	—	—	—	—	1	—	4 <sup>1</sup>	Mother before mar- riage
16	4	3	—	1	—	—	4	2	2	2	At marriage
17	1	1	—	—	—	—	—	1	—	—	At marriage
18	2	1	—	—	—	1	—	—	—	—	At marriage
19	1	1	—	—	—	—	—	—	—	—	Unmarried mother
20	7	3	—	3	—	1	3	1	1	1	At marriage
21	2	1	—	—	1	—	1	1	—	2	At second marriage
22	1	1	—	—	—	—	—	—	—	—	At marriage
23	2	2	—	—	—	—	1	5	—	—	At first marriage
24	3	1	—	—	—	2	1	—	1	—	Doubtful
25	2	1	—	—	1	—	—	—	—	4	Seven years ago, after one child
26	1	1	—	—	—	—	—	—	—	—	Unmarried mother
27	2	1	—	—	1	—	—	—	—	5 <sup>1</sup>	Five years ago, after one child
28	1	1	—	—	—	—	2	—	2	2	At marriage
29	5	1	—	—	4	—	3	4	3	1	Doubtful, after four children
30	5	3	—	—	—	2	3	2	—	—	At marriage
31	2	1	—	—	1	—	—	—	—	2	Doubtful, after one child
32	4	1	—	—	—	3	—	—	—	4	At marriage
	88	41	4	4	21	18	28	22	12	31	

Total Pregnancies: Addition of Columns (2), (8), (9) and (11), i.e., 169.

Column (6): Children believed to have been born before syphilis entered family.

Column (7): Children who are well, according to mother's statement.

older children can with moderate safety be regarded as non-syphilitic and thus the necessity for complete serological testing may be minimized. In this case, the first husband was healthy as far as the mother knows, though she thinks he had a urethral discharge about the time that she had her first still-born child.

Whenever possible, child-bearing women have been sent to the Ante-Natal Clinic at the Women's Hospital and other known syphilitics to the general hospitals, but it is regretted that many suspected people have failed to come up for examination.

#### Conclusion.

Deep subcutaneous injection of nov-arseno-billon is regarded as a simple method of treatment gener-

ally applicable for all syphilitic children. The serious sequelæ are the abscesses.

Larger doses of nov-arseno-billon than are usually recommended have been given without untoward result. The general health of the children and active lesions have been beneficially affected by this method of using nov-arseno-billon.

Percutaneous intravenous injections are preferable in selected cases.

I am indebted to the chairman of the staff of the hospital for permission to publish this paper.

#### References.

(1) L. W. Harrison: "Diagnosis and Treatment of Venereal Diseases in General Practice," 1919, page 363.

(2) *Proceedings of the Royal Society of Medicine*, June, 1921, Volume XIV., No. 8 (Section of Diseases of Children).

<sup>1</sup> Self-induced.



## THE PSYCHIATRIC CLINIC.

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AUSTRALIA is fortunate in its present organization of State-controlled mental hospitals and locally-governed general hospitals, a system far superior to that which exists in England. But it matters not how perfectly these systems may be developed, they will not fully protect the mental health of the community if they are allowed to remain without stronger connecting links. We must respect the lead given by America in successfully establishing such a link between these two institutions, namely, the psychiatric clinic or psychopathic hospital.

There are two types of such institutions in America, one principally for early treatment and teaching purposes attached to a large general hospital, such as the Henry Phipps Clinic at the Johns Hopkins Hospital, Baltimore, and another more for research work connected with a large mental hospital or groups of mental hospitals, such as the Psychiatric Institute at Ward's Island, New York City. It is particularly the former type which is required in Australia.

The establishment of a chair of psychiatry and the opening of a special hospital for uncertificated mental patients in one university centre, the provision of a research professorship of medical psychology in another, the establishment of a Federal Department of Health and the growing attention to the problem of mental deficiency are all important advances. But in the field of mental hygiene a link is needed between the well-established systems of mental and general hospitals.

The psychiatric clinic or psychopathic hospital exists for the treatment of persons with all types of psychopathic disorders, who are not in need of certification and detention for treatment in mental hospitals. Indeed, a certain number of insane patients with typical types of mental affections are often treated in psychopathic institutes in university centres to form material for research and teaching purposes. The psychiatric clinic is particularly necessary in connexion with a general hospital where medical students receive their training. There are advantages both to the clinical and to the general hospitals in having the close cooperation between the two:

(a) Patients of constitutional psychical inferiority who continually appear and reappear in the out-patient departments and are generally given symptomatic treatment, are transferred to the psychiatric clinic, where their intelligence can be properly estimated and treatment on a psychological basis given.

(b) Early treatment of psycho-pathological conditions is encouraged and the cloud which has long overshadowed mental conditions is removed.

(c) No marked social distinction is made between early diseases of the mind and diseases of the body; they are all part of the material to be dealt with in the general hospital.

(d) The organization of the general hospital, with

its special departments for diagnosis and treatment of organic complications, is at hand.

(e) Both the medical profession and the general public soon observe that incipient mental conditions are best dealt with by specialists in psychological medicine.

(f) Recruits for the medical work of the mental hospital services are increased, because of the interest stimulated in this important branch of medical study.

(g) Nurses in the course of their general training can be taught how to treat mental conditions and mental complications of general diseases.

(h) The importance of the mental factors of health, too often neglected, are demonstrated to a wider field.

(i) The unstable elements in the community are reached by medical and social workers and adjustments made by which they can often be prevented from needing the protection of an institution.

(j) Persons in a suitable condition are brought into touch with the various social organizations.

Thus the psychiatric clinic as a link between the mental hospital and general hospital systems not only serves a public necessity of great importance, but also assists both of these systems. On the one hand, the general hospital is able to treat its functional nervous diseases under more satisfactory conditions and a greater number of recruits are obtained to carry advances in therapeutic methods into the mental hospitals. Further, the clinic can do much to dispel ignorance and to establish better methods of dealing with mental diseases as they appear in the home, in the school, in the courts and in the social body generally.

Perhaps the most satisfactory psychiatric clinic in America is the Henry Phipps Clinic, attached to the Johns Hopkins Hospital and University, upon which several other clinics are modelled. An important part of this clinic is its out-patient dispensary. Visiting medical officers see patients in this department, which is open daily. Large numbers of defective children are brought here by their mothers, often sent from their school teachers for advice. It is interesting to note that in most cases these backward children pass Binet-Simon mental tests for their correct age and their failure at school is generally due to some fault in the home relationships—a careless mother or a drunken or too severe father. The group method of education cannot be expected to suit each individual case. Mentally defective children are often detected and dealt with before their vicious habits develop and are carried on to other children.

About 15% of patients reporting are found to be syphilitic and therefore suitable treatment is given to many patients who would not have come under notice until symptoms of paresis or tabes had developed in later life.

Trained social workers are of the greatest assistance in this department. They go to the homes of patients and obtain the full history of the condition and family history and ascertain the environment in which the patient lives. They obtain from the school teachers particulars of the child's habits and failures at school. They follow up the cases with periodic

visits and often cut short likely causes of relapse. They keep in touch with all kinds of social organizations for the care of the mentally enfeebled. The problem does not end at the decision that the child is feeble-minded, but begins there and the consequence of this decision does not necessarily mean an institution. By the investigation of the patient's personal problems and by simple help in readjusting the patient to his environment or the environment to the patient, a great deal can be done, especially if the social worker understands the usual reactions of the human being. Such workers are trained in colleges adapted for the purposes and are selected because of their understanding of human psychology. They can thus deal with the patient in his social setting as intelligently as the psychiatrist deals with him in the clinic.

The cost of out-patient clinics and social service workers is small when their value as a means of reducing the necessity for prolonged care is shown. Many patients who would become a charge upon the State, are kept at home, either self-supporting or maintained by relatives. During two years' work at the Psychopathic Hospital, Boston, it is stated that twenty patients who would otherwise have required institutional care, were kept in the community by the activities of the Social Service Department. This saving in maintenance to the State was far greater than the salaries of the social workers. The American National Committee of Mental Hygiene is developing in the nation a high ideal of mental health and as a result of its activities the majority of the State hospitals now employ social workers to help the readjustment of patients in their environment after discharge from hospital. In the State of Massachusetts over 3,000 visits were paid by social workers in three months recently.

In England this system is being developed under the control of the Mental Welfare Association. Clinics are being established in connexion with many general hospitals and social workers are being trained.

The patients for treatment in the Henry Phipps Clinic are obtained mostly from the out-patient dispensary. There are in all 170 beds in eight wards, consisting of two wings of four wards each (one group for men and one for women), connected by an administrative block, containing offices, lecture rooms, library, therapy rooms, etc.. Considerable opportunity exists for the grouping of patients. The striking achievement of the Clinic is its high level of psychiatric nursing. General trained nurses are seen to take an equal interest in psychiatric cases and therefore the Clinic is producing a nurse of better personality than the usual mental nurse, capable not only of treating an insane patient efficiently, but of carrying out successfully the nursing of any concurrent physical disease.

The value of prolonged baths and little or no drugs in the handling of delirium and excitement is an important feature, which is applicable not only to cases of mental disease, but also to complications so often met with in general wards of the hospital. Several special baths for prolonged treatment are provided. The complete absence of restraint and the removal of doors from single rooms are noteworthy.

No patient is ever locked in a room. Patients in the acute stages are nursed, not restrained.

The massage, hydrotherapy and electrotherapy departments are used extensively, mainly as forms of suggestion. The gymnasium is an active part of the hospital activity. Occupational therapy is extensively practised. Workers trained not only in arts and crafts, but also in psychology, are able to gain the attention of many patients in work which will be of interest to them.

The research laboratories connected with the Clinic are stimulating an interest in psychiatry and finding more recruits for its study. Medical students are taught their neurology by practical methods. They prepare, cut and stain their own sections and build up models of the brain and cord in plasticine, showing the various nerve tracts.

The administration of the Clinic is under the control of the Medical Superintendent of the General Hospital, but its special activities are under the care of a Director-in-Chief, who acts as a consultant. An Associate Director is in charge of the out-patient dispensary. The details of administration and treatment are carried out by the resident psychiatrist, who has three resident assistant medical officers. The nursing service is controlled by the superintendent of nursing and each ward has specially selected charge nurses, the subordinates being general nurses from the main hospital undergoing training in the Clinic.

Each clinic or institute in America has a slightly different system of administration, with varying advantages. The institutes connected with mental hospitals have more equipment for research work in neurology and psychiatry than those connected to general hospitals.

Australia must make provision for its incipient cases of mental disorder on a larger scale than at present and the value of the psychiatric clinic to America suggests its adoption in Australia.

When possible, the clinic should possess a fairly large area of land, in order that convalescent patients can be kept apart from those recently admitted. Facilities for occupational therapy are of the greatest value where trained instructors of the right disposition are in charge. But the essential for success is an adequate staff of properly trained medical officers, nurses and social workers, whose experience can be obtained only in the clinic itself.

## Reports of Cases.

### CHRONIC INTUSSUSCEPTION.

By HERBERT H. SCHLINK, M.B., CH.M.,

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B.D., age 7, was seen on July 10, 1919. Her father stated that two months previously (May 10, 1919) the girl had been seized with a sudden attack of vomiting and diarrhoea after eating some bananas. At the time of the attack she had been seen by two medical men, one being of the opinion that it was due to wind and the other considered it a case of intestinal obstruction. She had been put to bed on starvation diet for a week, with the result that the pain ceased and her bowels had been less freely opened.

She had been allowed to get up, but it had been noticed that as soon as she moved about and took solid diet the pains and diarrhoea had returned with fresh vigour. She had spent the next two months off and on in bed. During the last three weeks a lump had been noticed in the abdomen. At no time did the patient pass any blood with her straining and diarrhoea, a factor which must have been responsible for the many diagnoses made by the half-dozen men who had seen her.

#### Condition on Admission.

The patient was a very emaciated and starved child, with a resigned and pain-racked expression. She sat in a stooping attitude, holding her abdomen with both hands, and complained of a terrible pain in the back and around the umbilicus. On palpating the abdomen a large sausage-shaped tumour was found in the left lower half of the abdomen. On rectal examination a mass could be palpated, but nothing like the ileo-caecal valve could be felt. An X-ray examination showed that the tumour, which had been variously diagnosed as malignant disease of the sigmoid, sarcoma of the kidney, hydronephrosis, enlarged retro-peritoneal glands and malignant cyst of the ovary, was really an intussusception.

#### Operation.

An operation was performed at a private hospital on July 14, 1919, under ether anaesthesia. The child was so weak, wasted and of such low vitality from starvation and pain that Dr. Lidwill decided to give her ether by the intra-tracheal method, which proved to be a great comfort during the manipulation. The abdomen was opened in the mid-line between the umbilicus and symphysis; the large sausage-shaped tumour was found to be an intussusception of the caeco-ileo-caecal variety (Clubbe), commencing at the *caput caeci*, and the apex of the intussusceptum reached well below the junction of the pelvic colon and rectum.

As might be supposed from its long standing, the walls of the colon were stiff, swollen and thickened, but of good colour. At first it seemed almost impossible to unfold, but gradually, by squeezing from below and occasional gentle traction from above, the thickened, wash-leather like colon unravelled. Although the surface was slightly rough and

granular, no adhesions whatever had formed. The dimple of the *caput caeci* was easily squeezed out and the appendix removed. After a few gut sutures were inserted in the worst of the peritoneal tears on the sheath of the intussusciens (sigmoid flexure), the abdomen was closed.

The patient made an uneventful recovery and rapidly regained her normal weight.

#### Commentary.

The girl having recovered from the acute symptoms which accompanied the invagination of the caecum as well as the ileo-caecal valve and lower part of the ileum

into the ascending colon, peristaltic action gradually passed the intussusceptum on until the apex lodged in the rectum. Thus the patient had to live many weeks as if her large bowel had been excised, a fact which accounted for her fluid motions and to some extent the extreme emaciation.

The fact that no blood appeared *per rectum* either during the acute initiation of the intussusception or during its progress along the ascending, transverse and descending colons, or while resting in its final position, is surprising. The absence of any adhesions, even after so long a period of contact, is unusual according to Treves and others, but this agrees with Dr. Charles Clubbe's observations. The bowel and mesentery showed little signs of circulatory interference, except an enormous thickening of all coats, so much so that on palpation it appeared as if large indurated ulcers existed on the mucous surface of the



SKIAGRAM OF CHRONIC INTUSSUSCEPTION.

caecum and malignant or tuberculous disease was regarded as a possible primary cause of initiation. On more careful examination, however, the thickening proved to be merely from hypertrophy and oedema. Reduction seemed at times to have failed, especially at the splenic and hepatic flexures, but with patience it eventually unravelled and the only damage done were a few peritoneal tears on the sheath.

The X-ray photograph by Dr. R. H. Sear shows very clearly the outline of the sheath and intussusceptum (the bismuth got in between the receiving layer and the returning layer). That there was sufficient room for this to happen accounts for the non-gangrenous state of the intussusceptum after such a long sojourn in the intussusciens.



## Reviews.

### GASTRO-INTESTINAL DISORDERS.

PROFESSOR W. RUSSELL offers his book on "The Stomach and Abdomen" as "a contribution towards the elucidation of the disorders and diseases of the stomach and other abdominal viscera as these have to be dealt with by the family practitioner and by the hospital and consulting physician."

The book is really a summary of Professor Russell's clinical teaching at the Royal Infirmary, Edinburgh, and is based largely on the experience gained in the wards, the operating theatre and the *post mortem* room. It is not to be taken as an exhaustive treatise on the subject of gastro-intestinal and other abdominal disorders, but rather as a very practical handbook containing many hints of value to the practitioner and as presenting modern ideas in a simple and practical fashion.

The author attaches importance to the distinction between excess and deficiency of hydrochloric acid in the gastric juice as a guide to treatment of gastric disorders. He extols the value of routine test-meal work. His insistence, likewise, on the value of careful physical examination is to be commended. He gives full directions as to the physical methods of determining the outline of the stomach, which may be studied and practised with advantage. These methods of examination are employed in addition to the skiagram.

Chapters on the liver, the spleen, the kidneys and *Bacillus coli* infections will be read with interest and profit. We can recommend the book generally as one of great interest to the practitioner who is seeking for guidance in the handling of disorders of the digestive organs. It will give him many valuable hints on the diagnosis and treatment.

## Public Health.

### THE PLAGUE OUTBREAK.

THE DEPARTMENT OF HEALTH OF THE COMMONWEALTH has issued Bulletins Nos. 30 and 31 under dates February 10 and February 16, 1922.

#### Plague in Human Beings.

In the fortnight ended February 11, 1922, only one patient was admitted to the Wattlebrae Isolation Hospital, Brisbane. There were no other infections in human beings in any other parts of Queensland during the period under review.

In Sydney a child, aged 14, from a convent school at Parramatta, died of plague on February 10, 1922. The infection was apparently traceable to premises in Liverpool Street, Sydney, where infected rodents were being found.

#### Plague in Rodents.

A small number of infected rodents continues to be detected in various parts of Queensland. During the fortnight ended February 16, 1922, two infected rodents out of a total of 3,764 examined were found in Brisbane. The work of fumigation and trapping on the vessels and wharves at Brisbane has been continued, but no infected animals have been discovered in this way. Townsville was apparently free from plague-infected rats from January 30, 1922, to February 11. In Cairns one infected rat was found under a wharf, while all other rodents caught proved to be free. One infected rat was found in Rockhampton on the premises of Denham Brothers. No other infected rodent was discovered in Queensland.

Ter: infected rodents out of a considerable number examined were reported from Sydney during the fortnight ended February 16, 1922. These rats were found in one building in Liverpool Street.

<sup>1</sup> "The Stomach and Abdomen from the Physician's Standpoint," by William Russell, M.D., LL.D.; 1921. London: Baillière, Tindall & Cox; Demy 8vo., pp. 329, with 35 illustrations. Price: 15s. net.

## Naval and Military.

### APPOINTMENTS.

THE following appointments, promotions, etc., have been announced in the *Commonwealth of Australia Gazette*, Nos. 11 and 14, of February 9 and February 22 respectively:

#### Australian Imperial Force.

##### APPOINTMENTS TERMINATED.

##### Second Military District.

CAPTAIN G. A. BROOKES, 11th April, 1919.  
CAPTAIN E. F. ERBY, 10th April, 1920.  
CAPTAIN N. B. CHARLTON, 24th October, 1919.  
CAPTAIN A. E. J. SCOTT, 2nd March, 1920.

##### Third Military District.

CAPTAIN D. BICKART, 18th July, 1918.  
CAPTAIN P. F. MANCHESTER, 22nd December, 1917.  
CAPTAIN M. A. STEWART, 24th December, 1918.  
CAPTAIN E. M. H. INGLIS, 1st January, 1920.  
CAPTAIN J. G. WHITAKER, 10th December, 1918.  
CAPTAIN L. HARTNETT, 6th May, 1920.

#### Australian Military Forces.

##### GRANT OF SUBSTANTIVE RANK ON THE RESERVE OF OFFICERS.

The Governor-General in Council has approved of the undermentioned being granted substantive rank on the Reserve of Officers, equivalent to that held by them in the Australian Imperial Force at the date of the signing of the Armistice, as from the dates set out against their names:

##### Second Military District.

##### To be Captains—

HAMILTON SPEIRS KIRKLAND, FRANK ERIC RAYMOND BIGGS, PERCIVAL GEORGE CRAGO, CHARLES REGINALD RALSTON HUXTABLE and MICHAEL OSWALD STORMON, 1st January, 1921.

##### Third Military District.

##### To be Captain—

HENRY McLORINAN, 1st January, 1921.

##### Fifth Military District.

##### To be Major—

HONORARY CAPTAIN MAX YUILLE, Australian Army Medical Corps Reserve, 1st January, 1920. (This amends the notification respecting this officer which appeared in Executive Minute No. 105/1921, promulgated in *Commonwealth of Australia Gazette*, No. 21, dated 10th March, 1921.)

##### CHANGES, &c.

The Governor-General in Council has approved of the following changes, etc., being made in connexion with the Australian Military Forces:

##### Second Military District.

##### Australian Army Medical Corps—

CAPTAINS S. P. LYTLE and H. H. JAMIESON are appointed from the Reserve of Officers, 1st February, 1922.

##### Third Military District.

##### Australian Army Medical Corps—

CAPTAIN J. A. BIRNIE, M.C., is transferred to the Reserve of Officers, 1st January, 1922.

##### Fifth Military District.

##### Australian Army Medical Corps—

To be Captain (provisionally)—LIEUTENANT (provisionally) A. W. FARMER, 1st February, 1922.

THE resignation of CAPTAIN W. J. BEVERIDGE of his commission is accepted, 23rd January, 1922.



## The Medical Journal of Australia

SATURDAY, MARCH 11, 1922.

### Pharmacology and Therapeutics.

A SHORT time ago the Queensland Branch of the British Medical Association brought its members into contact with the pharmacists of Brisbane for the purpose of discussing a very interesting problem of mutual concern. The Director of the College of Pharmacy of Queensland had been invited to address the meeting and he had selected the subject of the "Australian Pharmaceutical Formulary." In his address he directed the attention of his audience to the pharmaceutical aspects of the preparations which have been included in this publication. Although several points of importance were presented and a lead was given for the discussion on the pharmacy of these preparations, as well as on their therapeutic uses, the members elected to confine their remarks in the discussion which followed, to the general questions involved in the relations between the medical practitioner and the pharmacist. The reasons for the loss of an opportunity to examine the problems in pharmacy and therapeutics in a critical spirit are not far to seek. The medical practitioner has little leisure to study the chemistry of the drugs he employs and less inclination to trouble about the reactions which take place inside the medicine bottle and inside his patient. Dr. W. N. Robertson deplored the faulty training given to the medical student in pharmacology and *materia medica* and traced to this indifferent equipment the almost universal resort to proprietary and other ready-made preparations. A famous English jurist once stated that medical practitioners pour drugs of which they know little, into bodies of which they know less. This indictment is, no doubt, exaggerated and too severe, but it contains a modicum of truth. Moreover, it has some application to the profession as a whole.

The pharmacists might have discussed some questions in therapeutics. Notwithstanding the dis-

claimer about counter prescribing, it is common knowledge that the practice is very wide-spread. Indeed, it is doubtful whether the pharmacist can avoid playing the physician under the conditions obtaining to-day. Some people would not dream of consulting a doctor until the pharmacist has unconsciously revealed that the haphazard method of guessing at a diagnosis and chancing the prescription of a remedy is a failure. It is not improbable that pharmacists refrain from discussing with medical practitioners matters connected with therapeutics because of a disinclination to disclose the fact that they do undertake the treatment of symptoms. His entire lack of knowledge of therapeutics is not recognized by any layman.

The various speakers obviously felt that there is a need for collaboration and cooperation between the medical practitioner and the pharmacist. In the old country the estrangement is more evident than it is in Australia, for each side poaches on the other's preserves. Still, even in Australia there is a lack of understanding which tempts the doctor to restrict the legitimate business he should send to the pharmacist. This has the effect of compelling the latter to display and even to recommend nostrums of very doubtful value. The exorbitant prices charged by some pharmacists for proprietary preparations and for quite ordinary mixtures, the belief based at times on what seems to be *prima facie* evidence of unreliability of the drugs supplied by some pharmacists and the irritating habit some pharmacists have of recommending a pet doctor to their customers not unnaturally find a response in the advice given to patients that the prescription should be taken to a certain house in preference to all others. All this arises out of a want of clear understanding of the other man's point of view.

If medical practitioners would study the British Pharmacopœia and would follow the advances in pharmacological science, they would find less need for ready-made formulæ of prescriptions. The hospital pharmacopœias are of value on account of the possibility of reducing the cost of medicines prescribed on a relatively large scale. In private practice there is no advantage to be gained by the use of the formulæ. So-called elegant prescriptions with a dozen ingredients have gone out of fashion. The

modern physician exhibits a drug either by itself or associated with some indifferent flavouring agent when its therapeutic action is desired. Even a cough mixture need not contain a large variety of component drugs. Neither the handbooks issued by the hospitals nor the "Australian Pharmaceutical Formulary" are necessary for the purpose of guiding the practitioner in his prescribing.

The official pharmacopœia and the various unofficial publications serve an important function in standardizing the methods of preparation and the degree of purity of drugs in common use. The "Australian Pharmaceutical Formulary" is undoubtedly a valuable supplement to the other recognized works. In many instances the formulæ for the preparation of some of the mixtures, solutions, ointments and so on represent distinct advances over the older formulæ. These formulæ are useful to the medical profession. Others are of value to the pharmacist. The medical profession as a whole, however, has reason to rely mainly on the British Pharmacopœia, on the Codex and on Martindale's "Extra Pharmacopœia" for standard methods of preparing special combinations of pure drugs.

It is held that the "Australian Pharmaceutical Formulary" serves the purpose of replacing numerous highly-priced proprietary preparations. It must not be forgotten that, while the great bulk of the proprietary preparations on the market is of greater value to the manufacturer than to the physician, there are many which possess definite therapeutic qualities in virtue of the methods of preparation. Very small differences in the methods may effect great differences in therapeutic action. The arsenobenzol drugs are all close imitations of the original salvarsan or neo-salvarsan of Ehrlich. Yet clinicians recognize that each manufacturer's product differs from the others in its action and toxicity. The secret processes employed by firms of the highest standing are at times of great value from the therapeutic point of view. It is quite obvious that these secret processes are but rarely discovered by chance.

It would thus seem that the importance of the "Australian Pharmaceutical Formulary" is somewhat limited and that it cannot replace the need for proper prescribing on the part of the medical practitioner, nor can it offer equivalent substitutes for

some of the more valuable proprietary preparations. It does, however, present to the medical profession some excellent formulæ which may be used with advantage in medical practice.

#### STRICKEN EUROPE.

In August last the Joint Council of the International Committee of the Red Cross and of the League of Red Cross Societies addressed an appeal on behalf of the starving and stricken people of Russia. In the course of this appeal reference was made to the action taken by Dr. Nansen, by Mr. Hoover in the United States and by the *Commission des Crédits* toward obtaining the assistance of the various governments. It seemed to those responsible for the drawing up of this appeal that relief work would not be effective unless it were directed by some powerful international organization, which would receive the recognition of the responsible government in every country. As the result of the appeal a conference was held in Geneva a fortnight later. There were representatives of twenty-two Red Cross Societies at the conference. Unfortunately, the Australian Red Cross Society was not among those represented. Her Excellency the Viscountess Novar was probably prevented from being present or from arranging for a delegate to attend. In addition, many countries were represented either officially or unofficially. In the last place, there were members attending in the name of the leading sociological organizations of the world. A strong sub-committee drafted ten motions for submission to the full conference. Among the recommendations was one to the effect that the joint Council should appoint an International Committee for Russian Relief and that Dr. Nansen and Mr. Herbert Hoover or his appointee be elected High Commissioners, with full authority to take the necessary action to administer relief. Dr. Nansen accepted the position by telegram and lost no time in getting to work. The story of his arrival at Riga and his extraordinary efforts to reach the threatened and affected communities is too well known to need repetition. In his dual capacity of High Commissioner for the Russian Famine under the Geneva conference and of High Commissioner under the League of Nations he struggled against the overwhelming difficulties

created by the devastating hands of war, revolution and social upheaval. He had the support of the governments of the world, but this support was inadequate and tardy. He had the good wishes of communities busily engaged in putting their own houses in order. He received the applause of people who read all about the famine, the pestilences and the hopeless misery in the vast territories of Eastern Europe. It shocked people with a well-filled larder and a bright fire in the hearth to learn of the terrible things that were happening in Russia. Money and goods were sent; large amounts and immense parcels. Dr. Nansen found that the world was underestimating the disaster and the demands of millions. Then came the cry of the babies. In September the International Save the Children's Fund (*Union Internationale de Secours aux Enfants*) held its third meeting at Stockholm. Sixteen countries were represented, including Great Britain. It was resolved that those who were able, should be invited to render effective help to Dr. Nansen and the relief organization, more particularly to succour the starving children of Russia, Armenia, Turkey and other countries in Eastern Europe and the Near East.

Still the cry comes from the other side of the world for help. The Australian Relief Fund for Stricken Europe, under the Presidency of Her Excellency Lady Forster and the Chairmanship of the Honourable Sir Henry Braddon, took up this work of mercy and humanity. The nationality of the suffering people was of no moment. There were human beings steadily approaching a ghastly death from want of food, warmth, means of decent living, protection against disease. There were willing workers on the field battling against obstacles and difficulties of the most appalling kind. True, the remedies were obvious and clearly defined. Food, clothing, fuel, the ordinary necessities of life, a strict sanitary supervision, all things within the reach of the citizens of other lands, would act like a charm. The means of obtaining these remedies were not available. The Australian Relief Fund pleaded for help in the form of monetary contributions. It must be remembered that our mother country has already done much, despite her own financial embarrassment and disturbed post-war conditions and has been active from the start. Australia has less

of a post-war burden than other countries and has not been officially nor unofficially represented in any of the many organizations concerned in this campaign. In each State of the Commonwealth there is a Committee of the Fund under the Presidency of the large-hearted wife of the State Governor. The local organization is a convenient channel for the citizens of Australia to lend their aid to assuage the lot of millions. It should not be necessary to plead for assistance. Lady Forster's appeal should soften every heart.

#### QUINIDINE IN AURICULAR FIBRILLATION.

THE work of Mackenzie, Thomas Lewis, Hertz, Goodhart, Jolly and Ritchie has focussed the attention of clinicians on the mechanism involved in the conditions spoken of as auricular fibrillation and auricular flutter. Shortly after the birth of modern cardiology the older conceptions of auricular fibrillation and auricular flutter were revised and a more hopeful view was taken of the peculiar cardiac irregularity characterized by rapid auricular contractions, apparently independent of ventricular contractions. About this time it was noted that digitalis, the drug which was supposed to be endowed with the power to steady the cardiac action in all forms of heart disease, not only failed to improve the patient's condition in the presence of auricular flutter, but actually exaggerated the distress until fibrillation appeared. Pharmacologists thereupon endeavoured to discover another drug which would retard this useless expenditure of cardiac energy. For many years it has been recognized that quinine exercises a depressant action on the cardiac muscle and some of the older physicians used it with apparent success in "heart disease." Whether its employment was limited to any particular form of myocarditis or endocarditis is difficult to ascertain. It was therefore scarcely surprising to learn that, with the better understanding of the mechanism of auricular fibrillation, an attempt was made in 1914 by K. F. Wenckebach to cope with this condition by giving quinine in doses of six centigrammes. The choice of the drug, however, was empirical and not rational. A Dutch merchant living in the tropics discovered that when he took quinine for his ague, his attacks of cardiac irregularity ceased. Wenckebach recognized that the quinine controlled the periodic attacks of auricular fibrillation, although the effect was evanescent. A short time later W. Frey carried out some systematic investigations on the action of cinchona and its alkaloids in auricular fibrillation and made the interesting observation that of the four known alkaloids, quinine, quinidine, cinchonine and cinchonidine, the second exerted the best depressant action on the heart and was the least toxic. In 1918 he published the records of the effect of quinidine given to twenty-two patients with auricular fibrillation. It brought complete relief to eleven. He gave the drug by mouth in doses, starting at 0.2 gramme



and increasing to double this quantity. Frey's work attracted considerable attention, particularly in Germany. His observations were confirmed by several competent clinicians. In 1919 E. Schott recorded some studies on animals. He discovered that quinidine was by no means devoid of danger. Large doses were shown to lead to sudden arrest of respiration, while the toleration of medium-sized doses differed in different animals. At a later date Frey found that when auricular fibrillation was associated with cardiac failure, it was necessary to give digitalis first. A distinct interval was allowed to elapse before the quinidine was given. When Lewis evolved his hypothesis of "circus movement" (see THE MEDICAL JOURNAL OF AUSTRALIA, July 30, 1921, page 84), Frey and others supplied a more or less unconscious confirmation of the assumed gap in continuation of the circulation wave of contraction. Since then many contributions have appeared in European and American literature on the action of quinidine in this condition.

Frey was the first to warn clinicians of the dangers associated with its use. In certain individuals it appeared to give rise to paralysis involving the respiratory centre. In the individuals observed by Frey the respiratory failure was short-lived and the patients recovered. Drs. Arthur W. M. Ellis and A. E. Clark-Kennedy have studied its effect in seven patients.<sup>1</sup> While the normal rhythm was restored by quinidine in five patients, relapse was observed in one. In two of the five patients embolic infarction of internal organs occurred. They suggest that clots not infrequently form in the auricular appendices and that these clots may become detached when the auricular contractions are restored to their natural condition.

Dr. W. W. Hamburger has found that quinidine does not restore a heart affected with chronic auricular fibrillation to normal rhythm when there is advanced cardiac failure.<sup>2</sup> In some instances the effect is permanent, while in paroxysmal fibrillation the drug appeared to shorten the duration of the attacks and when given regularly to prevent their occurrence. He is convinced, however, that it is necessary to gather more information concerning the drug before it should be given therapeutically. Dr. A. W. Hewlett and Dr. J. P. Sweeney have watched the effect of quinidine in eleven patients.<sup>3</sup> They confirm the claims made that in recent auricular fibrillation it is capable of restoring the normal rhythm, but advise that it should not be given until the condition of the heart has been carefully studied and all indications of failure of compensation removed by other means. It appears that up to the end of 1921, approximately 250 patients had been treated for auricular fibrillation and the results published. The beneficial effect has been noted in about 50% of the patients. It is evident from the records that the pharmacological action of quinidine is not fully established. The inhibitory action on the cardiac muscle should be studied closely in order to ascertain whether nerve fibres and ganglion cells are primarily or secondarily attacked. Until fur-

ther information on the pharmacology of this drug is available, the utmost caution should be exercised in its exhibition. Under favourable conditions, however, it promises to become a very useful therapeutic agent.

#### THE EARLY DIAGNOSIS OF DIABETES.

THE association of pancreatic lesions and *diabetes mellitus* has been established beyond doubt. It has, however, not yet been determined whether or not diabetes or disturbances of carbo-hydrate metabolism are necessarily associated with gross lesions of the pancreas. It has been pointed out in these pages on more occasions than one that the work of F. M. Allen, although extremely valuable in defining and illuminating the effects of the exclusion by mechanical means of a relatively large amount of pancreatic tissue, should not be accepted without reserve as revealing the mechanism of inflammatory and infective changes in the pancreas in inducing a diabetic condition. Further, there is a tendency to interpret the experimental work of Allen in a manner which may be misleading. The fact that in certain circumstances the reduction of the amount of carbo-hydrate and protein in the diet, leading to a distinct reduction of the body weight may bring about a disappearance of the glycosuria, but it is extremely doubtful whether the pancreatic lesion can be removed by these means. If the disturbance of the pancreatic function is an essential factor in the production of diabetes, the re-establishment of the glucose tolerance by starvation treatment will merely induce a modified physiological balance, but not a restoration of the normal physiological function of the gland. Nevertheless, it is of considerable clinical importance to ascertain the exact relationship between a lowered glucose tolerance and recognizable lesions of the pancreas. A few years ago E. Wille discovered by a close study of the histology of the pancreas after death that the parallelism between the sugar tolerance and the state of the pancreas was by no means a constant one. It has been pointed out that mild or moderately severe disturbances of the pancreatic function may be present when the structure of the gland does not reveal any ascertainable anatomical changes. Further study of the pathological aspect of this subject should be carried out and the results correlated with the chemical and bio-chemical findings during life. Dr. James W. Sherrill has endeavoured to supplement the data on which the clinical recognition of the pancreatic function may be based.<sup>1</sup> The method adopted of attacking the subject is perhaps not new, but the use of the findings for the purpose of anticipating the clinical manifestations of diabetes would seem to be sufficiently ingenious to merit careful consideration. A series of persons was subjected to sugar tolerance tests after the ingestion of a full mixed meal and after the ingestion of 100 grammes of pure glucose dissolved in 200 cubic centimetres of water. The blood (plasma) sugar content was determined before the taking of the sugar and at five periods up to four hours. At the same time a control of the urine

<sup>1</sup> The Lancet, October 29, 1921.

<sup>2</sup> The Journal of the American Medical Association, December 3, 1921.

<sup>3</sup> Ibidem.

<sup>1</sup> The Journal of the American Medical Association, December 3, 1921.



was recorded. In the first series the persons were either normal subjects or were merely obese or manifesting some degree of arterial hypertension. In none of the persons was there any glycosuria and in none was there a definite hyperglycaemia after the ingestion of the glucose. From this Dr. Sherrill concludes that obesity and hypertension are not necessarily associated with a reduction of the power of the assimilation of sugar. In the second group the persons revealed a certain degree of impairment of carbo-hydrate metabolism. Some of these persons were supposed to be normal; others had arterial hypertension, while three were suspected of being diabetic. The glucose gave rise to a slight temporary glycosuria in nine out of fifteen. Eleven of the persons complained of symptoms suggestive of mild diabetes, such as weakness, nervousness, loss of weight and the like. All the persons with these mild symptoms were placed on a restricted diet and as the body weight became reduced, the symptoms disappeared and the persons appeared to derive definite benefit. The third and last group of persons were relatives of diabetics. The determination of a lowered glucose tolerance as measured by the plasma sugar and urine sugar curves after ingestion of a mixed diet and of 100 grammes of glucose revealed in several a disturbance of the glucose assimilation. Dr. Sherrill regards this as definite evidence of a pre-diabetic condition. He is prepared to attach considerable importance to the results of these tests. Apparently he holds the view that in association with the disturbance of sugar tolerance there is a heightened susceptibility to infective processes which may determine the appearance of manifest diabetes. Moreover, he elaborates the hypothesis that the symptoms of mild diabetes clear up under the influence of anti-diabetic diet. If the findings be accepted in the significance which he attached to them, the deduction drawn that diabetes is much more prevalent than is usually indicated by statistics would be inevitable. His further conclusion that the revelation of impaired sugar assimilation in the relatives of diabetics necessarily indicates the hereditary factor of the disease is less convincing. Similarly, he is treading on insecure ground when he recognizes in the findings of the tests evidence of the primary and secondary ætiological factors of diabetes. The identification of the lowered sugar tolerance as a manifestation of a disturbance of the pancreatic function demands the evidence at all events in a large proportion of instances of a definite lesion of the pancreas. Temporary metabolic disturbances, even if they be dependent on a temporary impairment of the pancreatic activity, does not necessarily spell diabetes. There is a well-defined difference between alimentary glycosuria and diabetes. Complete resolution of the latter, if judged from the clinical standpoint, is common, while even the mildest diabetes tends to persist and to increase in severity. On the other hand, the information revealed by careful observations of this kind will probably lead to an extension of our knowledge of the pathology of diabetes. These observations, however, should be correlated as often as possible with *post mortem* evidence of changes in the pancreatic parenchyma.

#### ANNUAL MEETING OF THE AMERICAN ANÆSTHETISTS.

WE have received from Dr. E. H. Embley, of Melbourne, a copy of a letter addressed to him by Dr. F. H. McMechan, editor of the *Quarterly Supplement* and *The American Year Book of Anæsthesia and Analgesia*. Dr. McMechan has interpreted the appearance of several articles in THE MEDICAL JOURNAL OF AUSTRALIA on anæsthesia and analgesia as an indication that the anæsthetists in the Commonwealth have formed a society or possibly a section of one or other Branch of the British Medical Association in Australia. While this surmise is not strictly correct, a very active body of skilled anæsthetists has arisen recently within the medical profession in Australia. Dr. McMechan wishes to be supplied with an exhaustive list of the names and addresses of Australian practitioners who are devoting their practice to anæsthesia. The Editor of this journal invites these practitioners in the several States to assist him in compiling such a list.

Dr. McMechan continues as follows:

We are trying in every way to encourage international relations among anæsthetists. Last year the Royal Society of Medicine paid us the great compliment of sending Mr. H. E. G. Boyle, of London, as official representative to the joint meeting of the Canadian, Inter-State and New York Anæsthetists with the Ontario Medical Association at Niagara Falls, Canada.

Now it may interest you and others of the Australian anæsthetists that the Pacific Coast anæsthetists will meet with the Californian State Medical Society at Yosemite, California, on May 15 and 16, 1922, just giving those in attendance time enough to get to St. Louis for the tenth anniversary meeting of the American Anæsthetists with the Mid-Western Anæsthetists on May 22, 23 and 24, the first three days of the American Medical Association Week. Also the Canadian Society of Anæsthetists has been invited to meet the Canadian Medical Association in Winnipeg about June, 1922.

It was suggested that the Branches of the British Medical Association or the Governments of the Commonwealth and the States might wish to send an accredited representative to attend these various meetings. It is probable that some of our anæsthetists may wish to attend these meetings. No doubt an official representation could be arranged in such an event.

#### THE WELFARE OF MOTHERS AND INFANTS.

AN institution exists in Sydney under the name of the Royal Society for the Welfare of Mothers and Babies. This Society has recently established at Petersham, near Sydney, a home for the education of mothers in infant feeding and mothercraft. The New South Wales Government promised a contribution of £2,000 in support of this movement, but we understand that no provision has been made for this subsidy in this year's Estimates. As the home serves as a training school for baby clinic and obstetric nurses, the need for its adequate support is self-evident. Dr. Margaret Harper, the Medical Superintendent, invites medical practitioners interested in the work to inspect the institution. The President of the Royal Society for the Welfare of Mothers and Babies appeals to the medical profession for financial support.

## Abstracts from Current Medical Literature.

### BIOLOGICAL CHEMISTRY.

#### Basal Metabolism of Children.

K. BLUNT, A. NELSON AND H. C. OLESON (*Journal of Biological Chemistry*, November, 1921) have made some measurements of the basal metabolism of underweight children. It had been established that infants under weight in proportion to their age showed a higher basal metabolism per kilogram of body weight or per square metre of surface than well nourished infants. On the other hand, Benedict had underfed a group of young men for a long period. He showed a basal metabolism progressively lower as the underfeeding continued. The basal metabolism had diminished, whether expressed as total calories, calories per kilogram of body weight or calories per square metre of body surface. The children studied in this investigation comprised fourteen attending a health school in Chicago and fourteen from an elementary school in the same city. The children were under weight as judged by the standards usually accepted by welfare organizations. The under weight was calculated from the height-weight relationship, without consideration of age. The children varied from 127 cm. to 152 cm. in height and varied from 10% to 30% to underweight. The basal metabolism has been measured with the portable apparatus of Benedict. The children lay on a couch in the morning without breakfast for thirty minutes before the experiment. The results have shown that their basal metabolism is higher than that of normal children. The excess metabolism has been as much as 40% in some children. No relationship was observed between the percentage of underweight and the excess of metabolism. On the average the excess of metabolism was rather more than 20% above normal rate.

#### Neutralization of Acidosis.

R. W. KEETON (*Journal of Biological Chemistry*, December, 1921) has studied the excretion of ammonia after the administration of hydrochloric acid. It is well known that the excretion of ammonia is greatly increased in that type of acidosis which occurs in the course of diabetes. Beta-hydroxybutyric acid and aceto-acetic acids are neutralized in part by ammonia. A similar increased excretion of ammonia follows the oral administration of hydrochloric acid. The excessive excretion of ammonia is not characteristic, however, of all forms of human acidosis. It occurs only in a small degree in the acidosis of uræmia and is absent in some varieties of spontaneous acidosis. The author has found that the intravenous administration of hydrochloric acid to dogs in practically the same dose as has been used in control experiments *per os* leads to an increased excretion of ammonia; but this is accompanied

by an increased excretion of total nitrogen. Practically a normal proportion of the total nitrogen is excreted as ammonia. When hydrochloric acid is given through the stomach, an increased percentage of nitrogen is excreted as ammonia. The author argues from these data that it is the passage of more acid blood directly through the liver which affects the conversion of ammonia to urea.

#### Sulphates in Blood.

W. DENIS (*Journal of Biological Chemistry*, December, 1921) has devised a new method for the estimation of sulphates in the blood of animals and men and has made a series of determinations of the oxidized sulphur in human blood in persons suffering from different diseases. His method consists in treating the blood with mercuric chloride in acid solution. After one hour a filtrate can be obtained in which the sulphate is precipitated by a solution of barium chloride. The turbidity of this fluid is compared with the turbidity of a standard solution of potassium sulphate. A set of experiments showing the order of accuracy of the method is supplied. A series of determinations made upon the blood of forty-one persons shows that the amount of sulphate in the blood is greatly increased in persons suffering from chronic nephritis or affected with uræmia. Whereas the amount of sulphur present as sulphate in the blood of normal persons is less than one milligramme per 100 cubic centimetres, in uræmia the blood contains from five to sixteen per 100 cubic centimetres. Two attempts of the author by different methods to demonstrate the presence of ethereal sulphates in the blood yielded negative results.

#### Relation of Cell Volume to Content of Chlorides in Blood.

A. NORGAARD AND H. C. GRAM (*Journal of Biological Chemistry*, December, 1921) have completed a lengthy study of the relation between the percentage of chlorides in the blood and the percentage volume occupied by the corpuscles. They show that in calculating the percentage of chlorides found in citrated blood and citrated plasma to that present in uncitrated blood and plasma a correction for the volume of the corpuscles must be introduced when dealing with plasma. From several hundred observations on fifty-two persons of various types they find that the percentage of sodium chloride in the plasma is constant, approximately 0.61%. The concentration of sodium chloride in whole blood is most variable in these persons, increasing when the cell volume diminishes and lessening *vice versa*. The changes in the cell volume are so considerable that it will be necessary to consider them in estimating the concentration of any substance in the whole blood from estimations made with serum or plasma. The percentage of sodium chloride in red blood corpuscle is very constantly about 0.31%. There is a single exception, in the case of persons suffering from pernicious anæmia,

in which the percentage is reduced. It may fall as low as 0.23%.

#### Proteins of Pecan Nuts.

F. A. CAJORI (*Journal of Biological Chemistry*, December, 1921) has made a study of the nutritive value of the proteins of the pecan nut, which has assumed some importance as a food crop in the United States of America. It had been noticed that rats could grow at a normal rate and attain adult size on diets in which the essential proteins were derived from various nuts, except in the case of the pecan nut. It was assumed that the proteins of these nuts were lacking in essential amino-acids. The author has concluded a study in which he shows that rats fed on the proteins from the pecan nut grow similarly to rats fed on whole-some diets and that the failure of growth in the original experiments was due to the presence of tannins. Later he could demonstrate that the immersion of the nuts in a suitable lye caused the outer layers, in which the bulk of the tannin is collected, to separate from the rest of the nut. Rats fed on the decorticated nuts grew at a normal rate.

#### Basal Metabolism of Women.

K. BLUNT AND M. DYE (*Journal of Biological Chemistry*, June, 1921) have made a study of the basal metabolism in seventeen normal women, with the primary object of finding out whether there is any periodic variation in the basal metabolism during menstruation. The Benedict portable respiration apparatus was used to make 216 observations on the women. In general the procedure of the Nutrition Laboratory (Benedict) was followed to determine the consumption of oxygen. In one instance determinations were made on twenty-six consecutive days. The results showed that there is no definite change in basal metabolism during menstruation. The average of the observations for menstrual and intermenstrual periods is almost the same and there is no rhythmical variation in metabolism during the observations. The daily variation in the rate of basal metabolism ranges from 7.4% to 28.8%, or an average of 13.2%. This range is approximately that observed in other groups of women. The basal metabolism has proceeded at a lower rate than that calculated from the formulae of Benedict and Du Bois. The figures obtained varied from 32 to 36 calories per square millimetre of body surface per hour and from 1,200 to 1,600 calories *per diem*.

#### Estimation of Urea in Urine.

R. L. STEHLE (*Journal of Biological Chemistry*, June, 1921) has introduced a modification of the hypobromite method for the estimation of urea in urine which has the advantages that it is so rapid that a result is obtained in ten minutes, that no standard solutions are needed, that the reagents are simple and easily prepared and that there is no opportunity in the procedure "for things to go awry." He claims that these advan-

ages may make the method more acceptable than the urease method which is now in general use. The essential feature of the modification is the previous removal of salts of ammonium from the urine by agitation with permittit. The urea is estimated by mixing the diluted filtrate with sodium hypobromite solution. Under the conditions employed nitrogen is liberated quantitatively from the urea, but to an entirely negligible extent from other urinary constituents. The author has made comparative analyses to demonstrate the accuracy of the method. Full details of the procedure to be adopted are given in the paper.

### PHYSIOLOGY.

#### Phagocytosis of Quartz and Carbon.

WALLACE O. FENN (*The Journal of General Physiology*, May 20, 1921) has endeavoured to determine the conditions governing the phagocytic action of leucocytes on quartz and carbon particles, more particularly on account of the importance of the laws determining the removal of duct from the lungs. Clinical observations indicated that carbonaceous particles would be ingested by leucocytes more readily than siliceous particles. In the first place, he instituted a study of the comparative rates of phagocytosis when the particles were suspended with leucocytes. It was necessary to have regard for the size of the particles, for the calculated chances of collision with leucocytes and for the possibility of factors such as agglutination disturbing the ingestion. The rate of phagocytosis was calculated on a well considered formula based on the number of particles remaining outside the leucocytes. It was shown by this method that carbon particles were taken up three times as fast as the quartz particles. In the next place, the author applied another method in order to exclude the disturbing influence of agglutination. A thick suspension of cells with equal numbers of carbon and quartz particles was allowed to run into a space created on a slide by a cover slip raised at the corners and at the centre by fragments of thick cover slips. The cell thus formed was sealed by means of paraffin and kept on the warm stage. This method reduced the variation in the chance of collision, since the leucocytes, by creeping about, would meet with the particles in proportion of frequency to their size. The results of observations with this method revealed the fact that the rates of ingestion of carbon and quartz particles depend largely on the condition of the leucocytes. The difference increases as the phagocytic activity of the cells decreases. The author is inclined to the view that the more rapid ingestion of carbon is determined by the cause of the greater instability of the suspension. Various workers have endeavoured to show that, while quartz carries a high negative electrical charge, carbon should be regarded as a non-electrolyte. Low surface tension be-

tween a particle and a liquid is held to correspond with a high electrical charge. The rate of settling of a particle out of suspension will necessarily be determined by the surface tension. The author also comes to the conclusion that solid particles like bacteria are more readily ingested when they are easily agglutinated.

#### Fatigue in Mental Occupation.

J. P. BAUMBERGER (*The Journal of Industrial Hygiene*, September, 1921) has carried out a series of observations on the development of fatigue in mental occupations. The subjects were women clerks in the auditing department of a large railroad company. Their work consisted in entering in writing names on pay sheets and typing in the amounts. This work was conducted for a few hours over a period of fifteen to twenty days. Observations were taken concerning the output of each individual per hour and the records were expressed on a percentage basis. It was shown that, as far as the writing in of names was concerned, the output rate started at 106.8 during the first hour, fell to 100.5 in the second hour, rose again to 111.1 in the third hour, remained at a lower level during the fourth, fifth, sixth and seventh hours and rose slightly in the eighth rose, prior to a decrease in the ninth. While the output curve is not typical of fatigue, it certainly shows that a greater amount of work per hour is carried out in the morning than in the afternoon. Further observation showed that the error percentage increased as the output of work decreased. Similarly, the curve indicating the quality of the work, which was based on the reciprocals of the percentage error output, was somewhat irregular, but was high in the early part of the morning and showed a slight recovery late in the afternoon. Baumberger is of opinion that the output is maintained by a lower form of consciousness, while the quality varies with conscious attention, which is more subject to fatigue. He explains the irregularity of the fatigue curve by assuming that the output is maintained at approximately one level as a result of an increasing effort. He therefore claims that a normally recurring routine occupation of a few minutes' duration is a valuable criterion of fatigue.

#### The Effects of Stimulation of the Hepatic Nerves.

W. B. CANNON, J. E. URDIL AND F. R. GRIFFITH (*Endocrinology*, November, 1921) have published a short note on the effects produced by the stimulation of the nerves of the liver. They point out that splanchnic stimulation, after removal of the suprarenals, causes a faster beat of the denervated heart. Stimulation of the hepatic nerves causes an increased rate, which appears later and lasts longer than the adrenalin effect. This stimulation also causes a rise of blood pressure, but the rise is not dependent on the retarded blood flow through the liver, since it does not occur when the hepatic artery and vein are closed. The increase in the rate of a heart is slight

when the animal is fasting and is considerable when it is digesting meat. It is suggested that a substance is given off by the liver into the blood stream and that this substance raises the rate of the denervated heart. Neither glucose, urea nor catalase produce this effect. Similarly aqueous extracts of liver are inert. An extract of liver produced by boiling it in acid and nearly neutralizing the filtrate has this action. The authors point out, however, that acid extracts of other organs are similarly endowed. They have arrived at the tentative conclusion that the effects noted are caused by amino-acids or amines, which are sympatho-mimetic in character.

#### The Flow of Oxygen Through the Pulmonary Epithelium.

J. BARCROFT and others (*Journal of Physiology*, May, 1920) have investigated the theory of oxygen secretion. The general scheme of the experiment was as follows: The subject was exposed to a partial pressure of 84 mm. of oxygen in a glass chamber for six days. A comparison was made between the amount of oxygen in blood taken directly from the radial artery and the amount of oxygen in the same blood after it had been shaken with the alveolar air of the subject. The comparison, which was made with the subject at rest, was repeated whilst he was taking exercise. Had the arterial blood as withdrawn directly from the artery contained more oxygen than appeared in the same blood when shaken up with alveolar air, proof would have existed of oxygen secretion. The results show that the arterial blood *in vivo* contained less oxygen, both during rest and work, than did samples of the same blood exposed to alveolar air *in vitro* at body temperature. Other experiments were performed to prove that there was no self-reduction of the blood sufficient to invalidate the determination of the percentage saturation of the blood withdrawn directly from the radial artery.

#### The Function of the Urinary Tubules in the Frog.

M. ATKINSON, G. A. CLARKE AND J. A. MENZIES (*Journal of Physiology*, August, 1921) have described experiments to ascertain whether any solid constituents pass into the urine through the tubular epithelium in the frog or whether Cushny's view that the sole function of the tubules is re-absorption, holds good. Perfusion of the renal arteries with oxygenated Ringer's fluid containing sodium sulphate and with urea caused both these substances to appear in the urine. The renal arteries were perfused with oxygenated Ringer's fluid containing sodium sulphate and urea. Sodium sulphate and urea both appeared in the urine. Similar experiments were performed with glucose. It was found that arterial perfusion with oxygenated Ringer's fluid containing 0.1% to 0.5% of glucose yielded urine which contained glucose. Arterial perfusion with oxygenated Ringer's fluid while the portal veins were perfused with Ringer's fluid containing 0.1% to 0.5% of glucose, yielded urine free from glucose.



## British Medical Association News.

### SCIENTIFIC.

A MEETING of the Queensland Branch of the British Medical Association was held at the B.M.A. Rooms, Adelaide Street, Brisbane, on November 4, 1921, Dr. A. GRAHAM BUTLER, D.S.O., the President in the chair.

THE PRESIDENT announced that the members of the Queensland Pharmacy Board and of the Pharmaceutical Society of Queensland had been invited to attend. He extended a cordial welcome to those who had availed themselves of this invitation.

#### "The Australian Pharmaceutical Formulary."

MR. R. C. COWLEY, the Director of the College of Pharmacy of Queensland, read a paper entitled "The Pharmacy and Chemistry of the Australian Pharmaceutical Formulary," an abstract of which appears on page 257.

DR. A. C. F. HALFORD said that the Australian Pharmaceutical Formulary contained preparations for which the general practitioner had been asking. He instanced the preparation of bismuth and pepsin. Dr. Halford referred to the part Mr. Cowley had played in the compilation of the Formulary.

MR. H. I. C. DENT, the President of the Pharmaceutical Society, expressed the opinion that the Australian Pharmaceutical Formulary would obviate the stocking of expensive proprietary lines and would thus reduce the cost of prescriptions. The Pharmacy Board had addressed the pharmacists on the question of the ethics of their work. It had been pointed out that the function of the pharmacist was to dispense prescriptions and not to prescribe. Mr. Dent trusted that the medical profession would lend its assistance in the preparation of the next edition of the Formulary.

DR. W. N. ROBERTSON thought that the pharmacist was leading the doctor by the nose, judging from the trade advertisements. Medical students were not taught how to prescribe properly. He held that the Australian Pharmaceutical Formulary would serve as an indication to prescribe sensibly and elegantly.

DR. E. S. MEYERS considered that the use of proprietary preparations was due largely to the energetic pushing of their wares by travellers engaged by the various firms.

MR. N. McDERMOTT spoke of the undesirable habit of many medical practitioners of telling their patients to go to a particular pharmacist. He regarded this habit as an insult to the pharmacists of Brisbane.

MR. J. RICHARDSON drew attention to the remarks at times made by medical practitioners regarding the prices charged for proprietary preparations. These remarks were often based on inaccurate information.

MR. R. C. PARK, the President of the Pharmacy Board of Queensland, said that his Board was endeavouring to raise the standard of pharmaceutical practice in Queensland to as high a level as that of any other part of Australia. They were doing their best to deal with the "black sheep" of their profession. They did not countenance counter prescribing and other unethical practices.

DR. A. GRAHAM BUTLER thanked Mr. Cowley for his interesting paper. He held that the formulæ were ends in themselves to the pharmacists, while to the medical practitioners they were additional weapons in the armoury against disease. He agreed that the medical profession should co-operate in future revisions of the Australian Pharmaceutical Formulary.

In his reply, Mr. COWLEY stated that therapeutics were not taught at the College of Pharmacy. He thought that an exhibition of the galenical preparations of the Australian Pharmaceutical Formulary would be a valuable means of education for both medical practitioners and pharmacists.

## Medical Societies.

### MELBOURNE PÆDIATRIC SOCIETY.

A MEETING of the Melbourne Pædiatric Society was held at the Children's Hospital, Melbourne, on April 13, 1921, Dr. H. HUME TURNBULL, the President, in the chair.

#### Keloid.

DR. ROLAND WETTENHALL showed a child in whom an extensive keloid was under treatment by X-rays and radium. The boy was scalded in November, 1920, and five months later again sought treatment for keloid in the bend of the right elbow. At that time the keloid was extensive and exhibited much scaling and irritability. The initial improvement following the institution of treatment by X-rays and radium was seen in a reduction of vascularity. This was followed by diminution in size of the keloid.

Dr. Wettenhall was of opinion that such a thick mass of keloid tissue as that he had demonstrated, would leave a residue of fibrous tissue. If, however, X-ray treatment could have been instituted at the very outset of the keloid development, the present condition might have been obviated.

#### Tonsillectomy.

DR. R. M. DOWNES read a paper on "The Indications for Tonsillectomy" (see page 261).

Prior to reading the paper, Dr. Downes exhibited three children, all of whom had been affected with tuberculous cervical adenitis for fifteen, eight and fourteen months respectively. The tonsils in each instance were shown histologically to be tuberculous.

MR. W. KENT HUGHES said that the paper read by Dr. Downes had introduced a discussion of very wide range. He gathered that in practically all of the one hundred cases reviewed by Dr. Downes the tonsils had shown some pathological changes. He was convinced that hypertrophied tonsils, apart from any consideration of sepsis, conducted to a certain amount of mechanical congestion involving the naso-pharynx and Eustachian tubes. Catarrh of the middle ear was a clear indication for the removal of such tonsils. There was undoubtedly great difference of opinion as to the indications for tonsillectomy, but there was one condition for which he always performed it, *viz.*, earache. Catarrhal deafness was unfortunately too common and the dangers attendant upon persistent congestion of the middle ear seemed to be not sufficiently realized. It was imperative to take such measures as were possible to check thickening of the mucosa of the middle ear.

Dr. Downes had raised the question of mouth-breathing, a habit for which the usual explanation of obstruction to the airway by enlarged tonsils and adenoids did not always suffice. Children with large adenoids and tonsils were not invariably mouth-breathers and, conversely, mouth-breathing might be seen in some children whose tonsils were small and in whom there was no appreciable development of post-nasal adenoid vegetations. It was to be remembered also that mouth-breathing often persisted after the obstructing tonsils and adenoids had been removed and breathing exercises and instruction were essential as supplementary to the operation in correcting the faulty habit.

He was pleased to note that Dr. Downes had drawn attention to sinusitis as it occurred in children. He was convinced of the large part played by infected antra in maintaining chronic pulmonary troubles and a profuse mucopurulent nasal discharge in many children.

He did not regard the size of the tonsils as of much importance. Indeed, as Dr. Downes had pointed out, the size of these structures was difficult to estimate, as the buried portion of the tonsil was a very variable factor.

Tuberculosis as it affected the tonsil was a very vexed question, but he considered that all tonsils showing signs of sepsis in tuberculous children should be removed. Such tonsils were incapable of dealing with a tuberculous infection and thus became a menace to the cervical glands.

Mr. Kent Hughes commented on the remarkably beneficial effect of tonsillectomy in so-called rheumatic affections and

commended the operation as an efficient means of dealing with obstinate diphtheria carriers. In the latter class of case he had not experienced failure.

He was at variance with Dr. Downes with regard to the advantage of less post-operative pain claimed for the Redpath guillotine. He preferred O'Malley's guillotine, but he had abandoned the latter on account of several severe hemorrhages which had followed its use. He had found that, as a rule, if there was no interference with the anterior faucial pillar, there was not much after pain. He objected to the crush-cutting guillotine on the ground that it converted a minor into a major operation. The neatest method of enucleation was that of Tilley and Waugh, but it was difficult to accomplish in the presence of adhesions.

Mr. Kent Hughes added some remarks on peri-tonsillar abscess and urged that the abscess be dealt with by complete enucleation of the tonsil at the time. The procedure of incising the anterior pillar of the fauces involved extra pain for the patient and led to the formation of dense adhesions, which made subsequent removal of the tonsil very difficult. He performed enucleation with the tonsillotomy, used as a grasping forceps, and scissors. With the latter the tonsil was stripped from the anterior pillar and freed all round of adhesions. It was very important that no attempt should be made to avulse the tonsil in cases of peri-tonsillar abscess, as it was very friable.

In dealing with peri-tonsillar abscess, Ballenger had advocated stripping the tonsil from the anterior pillar, but had stopped short of enucleation. In a foreign journal it had been urged that a general anæsthetic should be avoided in operating for peri-tonsillar abscess, on account of the danger of the insufflation of septic material. He (Mr. Kent Hughes) had not experienced trouble of this nature during the last fifteen years.

Dr. W. DISMORE UPJOHN, O.B.E., commented on the criteria adduced by Dr. Downes as furnishing histological evidence of pathological changes in the tonsil. In the microscopical section exhibited he had noted the epithelial processes to which Dr. Downes had referred. He felt that in forming an estimate of their significance careful consideration should be given to the question of artefact. In cross sections of such a very plicated surface as the epithelial covering of the tonsil artificial appearances of epithelial outgrowths were very liable to be produced. The presence of cellular areas round the processes would, however, definitely indicate their irritative origin.

With reference to the histology of the tuberculous tonsils, Dr. Upjohn drew attention to the fact that various chronic inflammatory conditions led to the formation of cell systems and observed that giant cells were not diagnostic of tuberculosis.

The tuberculous process in a lymph gland usually resulted in much more destruction than was apparent in the tonsils exhibited. The real test of tuberculous infection of the tonsil was the demonstration of the bacilli.

He had been very interested in the paper and congratulated Dr. Downes upon the manner in which he had introduced the subject for discussion.

Dr. E. ALAN MACKAY tendered his thanks to Dr. Downes and remarked that in advising the operation of tonsillectomy due consideration must be given to the functions subserved by the tonsils. When healthy, these structures provided the body's first line of defence against infecting organisms of all kinds. It was important that they should be shown to be definitely diseased before removal was practised.

It was very frequently a difficult matter to say whether or not the tonsils were a menace to the general health. The bad effects from diseased tonsils might not become evident for some years. Many tonsils which appeared enlarged and unhealthy, resolved after the patient was given iodide or iron. Enlarged tonsils following the exanthemata frequently subsided and gave rise to no further trouble.

However, there could be no difference of opinion about the necessity for removing tonsils and adenoids associated with catarrh of the middle ear, nor about the majority of the well-defined indications discussed by Dr. Downes.

Dr. ALAN B. McCUTCHEON said that he was interested to note that as yet none of the speakers had considered the

operation of tonsillectomy, or partial removal of the tonsil. He concluded from that fact that it was a procedure not much in favour. If it were possible to shave off the infected portion of the tonsil and to leave a healthy stump which would carry on the normal defensive functions of the tonsil, there would be a good deal to be said for tonsillectomy, but he could not conceive that such a result could be achieved. The tonsillar crypts extended by a tortuous course from the surface to the capsule and it followed that surface infection meant infection of the whole gland; nothing short of complete enucleation could be relied upon to eradicate sepsis in the tonsil.

Dr. F. KINGSLEY NORRIS said that he had been especially interested in Dr. Downes's review of the series of cases which formed the basis of the paper, as he had seen the majority of the children in the out-patient department.

Dr. McCUTCHEON's remarks on tonsillectomy recalled to him the history of a girl, aged eleven years, who had been the subject of frequent rheumatic attacks. In a quiescent period tonsillectomy had been performed and it had been followed very shortly by an unusually severe rheumatic illness. At a later period the tonsils had been completely extirpated with a striking improvement in general health as the result.

It was a common observation that mouth-breathing persisted in some children after removal of tonsils and adenoids. It could not be too strongly emphasized that the removal of obstructing adenoids and tonsils, while it permitted the child to breathe normally, did not make him do so. The treatment was carried out imperfectly unless measures were instituted after the operation to correct the faulty habit of mouth-breathing.

The condition of the nasal accessory sinuses in children was often not easy to determine, owing to the difficulties of examination in such young subjects, but a general catarrhal inflammation of the nasal mucous membrane was often apparent; he found that the turbinate bones frequently required attention.

Dr. Norris pointed out that persistently enlarged cervical glands were not necessarily tuberculous and that many such glands subsided after attention to the nose, throat and teeth.

He agreed as to the efficacy of enucleation of the tonsils in the treatment of diphtheria carriers. To rheumatism and chorea as infections contracted *via* the tonsils he would add acute and subacute nephritis. He advised removal of the tonsils when the acute phase of nephritis had subsided.

With reference to the actual means adopted to perform tonsillectomy, Dr. Norris said that, while he could admire the operation by the Redpath guillotine as a matter of technique, it seemed to him to be taking a steam hammer to crack a nut. The slough after the use of the Redpath instrument certainly seemed less than that observed after the more usual methods, but he did not think that the advantage claimed of diminished hemorrhage was of much moment among children, in whom severe hemorrhage was a rare occurrence. Altogether the Redpath guillotine involved a more difficult technique and a less simple anæsthesia. He did not consider the final results so superior as to warrant its use.

In conclusion, Dr. Norris said that he was convinced that if the surgeon touched the tonsil at all, he should remove the whole of it and give particular attention to the condition of the nose at the same time.

Dr. ROLAND WETTENHALL drew attention to the frequency with which the lesions of *pyriasis alba* were observed round the mouth and nose of children with infected tonsils.

Dr. DOWNES, in reply, expressed his thanks for the appreciative comments of the speakers. He was glad to hear that Mr. Kent Hughes agreed that the size of the tonsils was largely unimportant; but he did not believe that it was necessary to remove the tonsils as well as the post-nasal growths as a routine procedure in cases of *otitis media*. A number of cases was seen which cleared up without this. With regard to the cause of mouth-breathing, removal of the post-nasal growths merely made it possible for normal nasal breathing, but it was also essential that a child should be taught to breathe through his nose after operation, if the bad habit were to be cured. He did not

intend to suggest that the tonsils were not a cause of cervical glandular enlargement, but his point was that the latter had less value as an indication for tonsillectomy than as an indication for removal of post-nasal growths. He had a very lively sense of the value of tonsillectomy in many cases of rheumatism and chorea. He had not removed any tonsils during an acute peri-tonsillitis, but had seen it done several times and was impressed with the great ease with which the tonsils came out; he was interested to hear of the difficulty Mr. Kent Hughes occasionally experienced in such cases. Personally, he was rather chary of disturbing by operation the barriers which were being formed against the spread of the inflammation. Operation in the acute stage was certainly a far easier procedure than after the inflammation had resolved and dense fibrous bands had formed.

He was quite sure that the out-shoots from the crypts were not artefacts; there were too many of them and their nature, sometimes only one or two cells in thickness and occurring throughout the length of a straight crypt, seemed to preclude this. Dr. Upjohn had also queried the aetiology of the tubercles in the sections he had shown. He did not feel qualified to discuss this, but the appearance of the giant cell systems seemed absolutely identical with those that were usually considered as due to infection by the tubercle bacillus.

The question of the defensive value of the tonsil was really what inspired this research and was an ever-recurring source of discussion. Dr. Downes considered that the tonsil had certainly some defensive functions, but was rather an imperfect mechanism, very liable to get out of order as the result of bacterial infection and become more of a danger than a defender. In these circumstances it should be removed and there lay the difficulty of determining when the negative value exceeded the positive. In the greater number of the tonsils examined there were what was taken to be signs of inflammation; but though this alone was not evidence of a continued harmful process, it probably meant an increased liability to be overwhelmed by any future infection, as was the case with the appendix or gall bladder. Furthermore, collections of pus and débris, with their micro-organisms, in the crypts were exceedingly common and it was reasonable to presume, though impossible to measure, some degree of toxic absorption from them. Whether the tubercle bacillus, found in such a definite proportion of all tonsils examined for it, was there because of the protective function of the tonsil or was the cause of disease in the tonsil, as in the three cases shown, was not easy to decide. It would need some positive evidence to establish its harmlessness. The tonsils occupied a very small proportionate surface of the oral and pharyngeal mucous membrane; if tubercle or other bacilli could pass through the rest of the mucous membrane as well, the tonsils would only be able to destroy a proportion of them; if they could only pass through the mucous membrane of the lymphoid tissue organs and sometimes infect the latter instead of being destroyed, then these organs would form a source of danger that would not exist in their absence. In regard to the question of complete or partial removal of tonsils, if they were diseased, it was necessary to remove them completely to eradicate the disease. Tonsillectomy could only be justified in cases in which it was the mechanical factor alone that was the cause of trouble; these were few. It was common to see tonsillitis in the remains of partially removed tonsils and their secondary removal was often far more difficult. One of the tonsil specimens shown illustrated the passage of the crypts to the capsule, as to which a question had been asked. It illustrated one of those cases in which, while there was a history of sore throats, the oral surface of the tonsil appeared normal, but two small collections of pus were visible macroscopically beneath the capsule.

His reason for favouring the Redpath crushing guillotine was not so much on account of its value in preventing secondary hæmorrhage, but because of the marked reduction of pain and of the area of slough in children after operation. As Mr. Hughes had said, secondary hæmorrhage was quite uncommon and there had only been one mild case in any patient admitted to the Children's Hospital in the last year.

He favoured the use of perchloride of mercury and gave it as a routine after operation till all slough had disappeared.

## Correspondence.

### A CRITICISM OF THE EVIDENCE GIVEN BY DR. S. A. SMITH REGARDING LEAD POISONING AMONG QUEENSLAND CHILDREN.

SIR: We have no intention of criticizing the Report of the New South Wales Board of Trade on White Lead as used in the Painting Industry: Its Dangers and Prevention, but perhaps we may be allowed to quote a few sentences from this report with approval: "The diagnosis of lead poisoning is not in itself of any great difficulty where any one of the classical symptoms is present, e.g., lead colic, paresis or the characteristic lead anæmia" (page 17). We agree; and we hope that the summary presented in a previous issue will convince Dr. S. A. Smith and other readers that lead poisoning does exist to an appreciable extent among Queensland children and that the members of our Branch are sufficiently well-informed in clinical medicine not to have failed in a task of no great difficulty. "The Broken Hill survey showed conclusively that chronic Bright's disease may be caused by lead as an industrial disease of very slow onset" (page 21). This rather strengthens a very strong suspicion, not a definite conviction, for the matter is one where proof is most difficult and as yet wanting, that some of the cases of chronic nephritis among young Queensland men, young single women and especially of eclampsia in young married women in their first pregnancies are due to lead poisoning in childhood. "The channels through which lead or its compounds may gain entrance to the body are the respiratory system, the stomach and the skin. There is no doubt whatever that the chief cause of lead poisoning is dust or fume suspended in the air and the dust inhaled is far more dangerous and produces symptoms of poisoning far earlier than that ingested. . . . Gastro-intestinal ingestion as a cause of lead poisoning in ordinary industrial conditions is, although relatively less important, by no means negligible" (pages 14 and 15). When powdery paint was first impeached as the cause of lead poisoning among our children, the possibility of its being inhaled as dust was mentioned. We were not then in the possession of recent research (Legge and Goadby: "Lead Poisoning and Lead Absorption," page 9), which has shown the greater importance of pulmonary than gastro-intestinal absorption in industrial plumbism. Possibly we may not have given sufficient attention to the possibility of the pulmonary route in our cases, though we still believe them to be chiefly or wholly due to gastro-intestinal ingestion. If the source of poison is acknowledged to be lead paint, the exact mode of entrance is to us a point of only secondary importance.

In the course of its inquiry the Board very sensibly summoned expert witnesses. Whether it should have extended its inquiries to non-industrial plumbism among Queensland children was a matter for itself to decide; but, having decided to do so, it would have been wiser to have obtained evidence from someone expert in that matter and acquainted with the evidence. It addressed the questions which concern us to Dr. S. A. Smith and with him we have to deal. Dr. Smith is an Honorary Physician of St. Vincent's Hospital, Sydney, an Assistant Honorary Physician of the Royal Prince Alfred Hospital and a tutor in medicine at the University of Sydney; appointments which show that he has a good standing in his profession. Recently he has been engaged for eighteen months in an inquiry into plumbism at Broken Hill and is therefore qualified to give evidence as to the conditions there. He has analysed the records of the Royal Prince Alfred Hospital with regard to cases treated for plumbism during the past twelve years. He is, of course, well acquainted with recent literature dealing with lead poisoning, though his knowledge of it is not quite faultless.

We do not intend to criticize in any way Dr. Smith's evidence regarding industrial plumbism at Broken Hill or elsewhere; nor shall we express opinions on any matters of which we have not first-hand knowledge. If Dr. Smith had maintained the same reticence, he would have saved himself and us a lot of trouble. We shall quote questions and answers *verbatim* with their numbers, but not neces-



sarily in the order in which they are given. Fortunately, the questions which concern us are comparatively few.

Q. 9570: There is a statement attributed to the press to Dr. Dodds which I will read and ask your opinion on. The statement is: "The President of the Association, Dr. Dodds, made the alarming statement that lead poisoning was frequently the cause of blindness in children, deaths of infants, paralysis and abnormalities and of the high death rate in Queensland due to eisanthema in pregnant women. It was also also the cause of the death rate through kidney disease of early adults." This is published in the *Brisbane Chronicle*. Did you hear that opinion attributed to Dr. Dodds? Yes.

Q. 9571: Do you agree with that view? I think it is a very ridiculous statement.

Q. 9575: This is a statement attributed to Dr. Dodds in the Brisbane newspaper and I ask for your expression of opinion on it. If Dr. Dodds did say that—personally I do not think he did—but if he did say it, it was an entirely ridiculous statement.

This is an amusing example of the way in which Commissions obtain evidence. A nonsensical extract from a non-existent newspaper is flung at a witness and he is asked what he thinks of it! We do not blame Dr. Smith for calling it ridiculous, nor for not attempting to unravel a journalistic conundrum. We are able to give a more correct report.

"Dr. Espie Dods stated that lead poisoning was a cause of blindness and paralysis in children, occasionally of death and probably the cause of the high Queensland death rate from eclampsia in pregnant women and of the kidney disease of young adults."

This is not a ridiculous statement by any means, but a very grave statement. The first half of the statement has been proved true beyond any reasonable doubt; the second half is a probable opinion, for which much might be said.

Q. 9606: Would you think that lead poisoning could be contracted by children rubbing their hands on verandah posts and fences and the like, when it had reached the stage that decomposition had set in and it was in a form that was removable by touching it? No, I do not think so.

Q. 9607: This is one of the grounds that is put forward by the persons advocating the prohibition of lead? Yes.

Q. 9608: But your opinion is that no injury would come to children in that way? Very definitely my opinion is that.

Q. 9609: The attack would be too casual? Yes.

Q. 9610: And of insufficient duration to warrant you thinking that permanent harm would come to the children? Yes, I think that if every particle of lead that a child, by rubbing his hands upon the fence, would introduce into his body through the gastro-intestinal tract, were introduced, no harm would result.

Dr. Smith either has not read the literature on the aetiology of plumbism in Queensland children, or he is singularly deficient in scientific imagination. He is evidently thinking of casual contacts with painted surfaces. Let him imagine a child of two years (we are speaking of an actual case) suffering from symptoms suggestive of lead poisoning and passing lead in its urine. Let him imagine that child spending many hours every day for many weeks on a verandah whose floor and railings are covered with powdery carbonate of lead. Let him watch the moist little hands grasping the railings and paddling on the floor, frequently withdrawn from them, put into the mouth, slobbered over and then reapplied to railings and floor. Would he in a case like this fail to see any relation of cause and effect? If so, how can he justify his answer to Question 9326? "There is no doubt poisoning does occur through the ingestion of lead into the digestive tract. . . . Most of the very well-marked cases of lead poisoning, or even of epidemics of lead poisoning, occurring through the ingestion of lead into the digestive tract, have been instances of a non-industrial character. There is no doubt it can occur by a transference from the hands, etc., to the digestive tract." Must we believe that an ordinary person may be poisoning from his hands, but a Queensland child cannot? Perhaps Dr. Smith will kindly explain.

Q. 9602: I take it, from the little attention I have given to the matter, that Dr. Gibson's theory is that optic neuritis in children as it occurs in Brisbane is probably caused

by the ingestion of lead? He goes further; he says definitely that it is caused by lead.

The question is incorrectly put. Dr. Gibson shows that some cases of optic neuritis in children seen by him are due to lead; he sees cases also due to gummatous meningitis, cerebral tumour and other causes and he discusses the differential diagnosis.

Q. 9603: It is the ingestion of lead, not the inspiration of lead? No, the ingestion of lead from the finger nails of the children who run their hands along the palings. I should say that his investigations are such as would not carry weight with a scientific body.

For the first part of this answer, it is not quite accurate. For the second, Dr. Gibson's evidence has carried weight with this Branch, which has always regarded itself as a scientific body; and has believed that among its members are at least a few worthy to be placed on a scientific level with Dr. Smith himself. The Australasian Medical Congress we have also believed to be a scientific body and, although members from southern States may have no first-hand knowledge of the matter in dispute, we have always thought them competent to weigh the evidence we had to lay before them.

Q. 9656: You were asked about blindness in children. Have you ever seen a case of blindness in children caused by lead? No; and I have never heard of a case occurring in Sydney.

Q. 9657: You were also asked about ocular neuritis in Queensland and I understood you to say that there was no proof that that was due to lead? No; there was no satisfactory proof that there was lead at all. It was largely an assumption on the part of Dr. Lockhart Gibson that it was due to lead, because he could not account for it any other way.

This answer is not in accordance with the facts. We advise Dr. Smith to read Dr. Gibson's papers more carefully. Legge and Goadby are recognized as very high authorities on lead poisoning. From their book, "Lead Poisoning and Lead Absorption" (page 150), we quote the following: "Lockhart Gibson describes a large number of cases of paralysis of muscles of the eye met with amongst children in Queensland. The cause was traced to the painted railings near which the children had been playing. The white lead paint had somewhat disintegrated under the action of the sun's rays, forming an efflorescence, the children" [were] "admitted to have rubbed the paint and then sucked their fingers. Between July 1905 and 1908 sixty-two cases of plumbism in children were admitted to the Children's Hospital and of these sixty-two cases thirteen had well-marked ocular symptoms. The paralysis of the muscles of the eye was almost invariably one of the external rectus, but other muscles were at the same time affected; occasionally paralysis of the whole of the oculomotor muscles was seen, with the exception of the superior oblique. It is worthy of note that amongst these children a very large number suffered, in addition to their eye paralysis, from foot-drop and wrist-drop" (this is a mistake, foot-drop and wrist-drop occurred in other children and were rarely associated with ocular symptoms in the same child) "and on the whole suffered from foot-drop to a much larger extent than from paralysis of the hands." And (page 160) "Lockhart Gibson, in describing the cases of eye disease amongst the children in Queensland, found one symptom apparently in all eyes examined, namely, great swelling of the discs. This swelling of the discs might be accompanied with no loss of sight whatever and at other times had been accompanied with defective sight for many months previously. Some of the discs were excessively swollen. There were also to be seen patches of pigment and irregular swelling of the vessels, but no definite hæmorrhages. In the more acute cases and particularly those associated with complete paralysis of the ocular muscles total blindness usually followed."

Legge and Goadby, experts in lead poisoning, quote Dr. Gibson's writings with respect. Dr. Smith, a smaller expert in the same line, speaks of them with disrespect. The pupil has tried to excel his masters.

We are sorry to write hardly of Dr. Smith, though he has spoken hardly of others; but we have no alternative. For thirty years we have continuously watched (at least

the elder men amongst us) the ravages of plumbism amongst our children. For seventeen years we have agitated for their prevention. At last, this year we have received a promise of the legislation we desire. At the last minute Dr. Smith's evidence is being used to block the way. It is being industriously copied and used against us by representatives of trade interests in our local papers. Unless we can show the emptiness of this evidence, it appears likely that the prevention of lead poisoning among children in this State may be postponed for another generation. How many young Queenslanders may suffer from pains, crippling, blindness and nephritis, should this be the result, we do not care to compute.

Drawn up for and endorsed by the Council of the Queensland Branch of the British Medical Association.

Yours, etc.,

R. MARSHALL ALLAN,  
Honorary Secretary.

Brisbane, January, 1922.

SIR: The Council of the Queensland Branch has been "put to the trouble" of attacking me on my evidence on lead poisoning before the New South Wales Board of Trade, but I am convinced that I have to answer, not the Council of the Queensland Branch, but Drs. Lockhart Gibson and Jefferis Turner.

Under cross-examination I criticized the following two claims put forward so frequently by these gentlemen:

(1) That lead poisoning occurs in many Queensland children as a result of the ingestion into the gastro-intestinal tract of white lead from the hands, particularly the finger-nails, the source of the lead having been proved to be the paint from verandah railings and floors.

(2) That among these children there is a definite group, characterized clinically by the presence of intense papilloedema and paralysis of one or more eye muscles, which has been proved beyond doubt to be due to lead poisoning.

I have never at any time taken up the position that all of the conditions clinically described by Lockhart Gibson and Jefferis Turner are not due to lead intoxication. I have, however, denied the contention that the source of the poisoning has been scientifically proved and that the correlation of the "ocular neuritis cases" with lead has been satisfactorily demonstrated.

If one were to admit that this theory is correct on these two points, it would necessarily involve acceptance of the fact that certain conditions in Queensland are unique in Australia and indeed in the whole world, namely, the conditions of life and housing and the frequency of a definite complex of which papilloedema is the outstanding characteristic, resulting from lead intoxication. Under these circumstances, it is of the utmost importance to determine if these claims are supported by evidence which is quite conclusive.

I disbelieve that the conditions of life and housing (considered in conjunction with climate) are so remarkably different in the State of Queensland to other parts of the world. The practices of painting verandah railings, etc., with lead paint and of allowing children to spend a considerable part of their days in the early years of life on such verandahs, are surely not confined to Queensland. They certainly obtain, even though it be to a much lesser extent, in other Australian States and other parts of the world with comparable climatic conditions. If the origin of the poison causing these illnesses were as claimed by Lockhart Gibson and Jefferis Turner, one would be justified in expecting that similar instances of disease would occur, even though in smaller numbers, in such other places in which children bite their nails, suck their thumbs and inhabit verandahs with painted railings and floors. But the literature contains no records of such, lead poisoning "being rare or unknown as a malady of childhood in the Southern States."<sup>(1)</sup>

The evidence on which the theory of ingestion from verandah railings has been founded, is summarized in a recent number of this journal,<sup>(1)</sup> namely, the study of the age incidence, the place incidence, the seasonal influence and the not very surprising discovery made by Lockhart Gibson in 1904 that soluble lead carbonate could be obtained from pieces of calico rubbed on verandah railings which

had been painted with lead paint. In his opinion, this last mentioned fact settled the matter beyond doubt. With this I entirely disagree. Having demonstrated that white lead was obtainable in this way, he made no investigation as to the amount of white lead which was available for ingestion from the hands and finger-nails of children exposed to this risk, nor has any effort been made to define the sizes of the particles to which the children are exposed by ingestion from this cause. These two facts must be recognized as of considerable importance in this question and no judgement can be given until these two necessary observations have been made.

Further, no effort has apparently been made to prove the ingestion of lead, since no adequate record exists of any investigation of the faeces for lead in a series of children living under the conditions in question. The results of such examinations, should lead be found, though not absolutely conclusive as to the channel of entry, would yet be evidence of a very valuable nature, if the investigations were suitably controlled. In place of evidence which would be satisfactorily supplied by observations of this nature, Lockhart Gibson expects one to be satisfied with bald statements like the following: "It may be accepted that in warm climates, easy access to the painted surfaces, in conjunction with the habit of biting the nails, may be expected to tend to the ingestion of lead and to consequent lead poisoning."<sup>(2)</sup>

But the ingestion of lead does not necessarily mean lead absorption, nor does lead absorption necessarily mean lead intoxication. To solve such a problem as this adequately, one should apply the same principles of investigation as in industrial plumbism. There is no real difference between this problem and those of an industrial nature, since these cases are claimed to be continuously arising among a certain section of the Queensland community as a result of environment, conditions of life and habits. Recent work has abundantly proved that if any group of individuals be exposed to a lead hazard, no matter what the channel of entry into the body may be, a considerable portion of these will show lead absorption as revealed most certainly by the presence of lead in the urine. Lead in the urine is only a sign of lead absorption; it is not, as claimed by Dr. Lockhart Gibson, "absolutely diagnostic of lead poisoning."

No more striking evidence of these facts has been supplied than by the investigation of the Technical Commission of Inquiry at Broken Hill, where examinations were made of a large number of men who were exposed industrially to the inhalation of a dust containing small quantities of lead, mainly in the form of a comparatively insoluble sulphide, with, in some cases, a relatively slight exposure to the soluble carbonate. Practically every man showed lead in his urine. Individuals who did not work in the mines, including some who had only lived in Broken Hill continuously for a few months and were exposed to a relatively slight extent, gave signs of lead absorption.

Investigations of a less extensive nature in other parts of the world have given similar results, *viz.*, that after exposure to the absorption of small quantities of lead, the metal may be found in the urine. Though Dr. Lockhart Gibson may not be conversant with the facts relating to lead absorption revealed by the Technical Commission's investigations at Broken Hill, he was yet aware of some observations of a not dissimilar character bearing on the ingestion and absorption of lead.<sup>(3)</sup>

But lead absorption does not mean lead intoxication. For example, among the men examined at Broken Hill showing lead in the urine, only a small percentage were suffering from lead poisoning or from conditions which might conceivably be due to lead intoxication. The length of exposure to lead in many of these men was between twenty and thirty years.

It is clear, therefore, that when a number of individuals are exposed to lead absorption, lead poisoning only appears in those who are susceptible or intolerant (from any cause) or who, in the absence of these factors, have absorbed a toxic dose.

That Lockhart Gibson has some vague appreciation of this generally accepted conception is obvious from some portions of a recent paper by him.<sup>(4)</sup> If, therefore, the theory is correct that poisoning results in Queensland children from the ingestion of carbonate of lead from verandahs and floors, a considerable proportion of children living under these conditions should show signs of lead

absorption as distinguished from lead intoxication. But no satisfactory attempt has been made to demonstrate whether this is so or not. In fact, since the publication of Lockhart Gibson's paper in 1904, proving the presence of lead carbonate on verandah railings, no effort has been made to prove either the ingestion of lead from this source or its absorption and his theory remains merely "an interesting suggestion" as Osler calls it<sup>(1)</sup> and not a proved fact.

But some evidence is available, although there is not sufficient to be decisive. Breinl and Young,<sup>(2)</sup> who were very alive to the importance of this fundamental point, examined the urines of a number of healthy children living under the conditions under discussion and failed completely to find lead in the urine. These children showed no signs of lead absorption. Should the examination of an adequate number of children confirm these results, it will be absolutely fatal to the verandah railing theory.

Under any circumstances, in the light of present-day knowledge of lead absorption and lead intoxication, the thorough examination of a large number of Queensland children of suitable ages and the correlation of these results to season, place, housing conditions, habits and the occurrence of signs of lead intoxication is necessary before any sound judgement can be passed on the truth of the theory under discussion.

Criticisms were also made of the statement that the clinical group characterized by "ocular neuritis" was due indubitably to lead poisoning. I stated that the proofs of this statement were not satisfactory and that it was largely an assumption on the part of Lockhart Gibson.

The outstanding fact in considering this group of cases is the rarity of papilloedema in lead poisoning as described by all other authors except Lockhart Gibson and Jefferis Turner. The former has himself drawn attention to this fact and quoted various statistics showing that in other parts of the world lead is very rarely the cause of optic neuritis.<sup>(2)</sup> Breinl and Young saw none of these cases in their relatively small North Queensland series. In fact, in lead poisoning elsewhere, optic neuritis occurs in a very small percentage of cases. In these cases also, it is not accompanied regularly by ophthalmoplegia. As Lockhart Gibson says: "I have found no record, except in my own papers, of a group of cases where optic neuritis due to lead was constantly associated with paralysis of at least one external ocular muscle."<sup>(2)</sup> The occurrence of cases presenting this complex is therefore unknown in lead poisoning elsewhere. Yet Lockhart Gibson in 1905 reported 54 among 200 cases (27%) of lead poisoning in Queensland children.

Why should lead circulating in the organs of Queensland children have an absolutely different effect to lead circulating in the organs of people who do not live in Queensland? Obviously some other factor is at work, either with or without the influence of lead. But does lead play any part at all? With these facts in mind, one must demand evidence which is conclusive. Let us consider the evidence.

A definition of this group has been summarized by Lockhart Gibson as follows:<sup>(3)</sup> "The disease is characterized by the sudden onset, with or without preliminary colic, vomiting and constipation and with or without severe headache, rigidity of the neck or retracted head and acute pains at the back of the neck, by paralysis or paresis of one or both external recti, accompanied by optic neuritis or choked disc and unaccompanied by rise of temperature or by albuminuria; accompanied also by the well-known blue line on the gums (produced by the deposit of the black sulphide of lead); by the finding of small but distinct quantities of lead in the urine; by the fact that the patient has had access to painted surfaces which have either been recently painted or more often whose paint has become powdery and easily detachable, this powder being the very soluble carbonate of lead; accompanied further by the fact that the patient bites his or her nails—the exception suck their fingers."

This definition needs amplification in that the blue line is "not infrequently absent" and the urine was tested for lead in a few cases only, in some of which it was present and in some absent.

These facts, together with a certain parallelism (the extent of which has not been indicated) to the paralytic types, in so far as age and seasonal influence is concerned, form the evidence which one has to examine.

The presence of the blue line is not diagnostic of lead poisoning, as Lockhart Gibson has recognized. Neither is the presence of lead in urine "absolutely diagnostic of lead poisoning," as has been pointed out. These, present in a few cases, are signs of lead absorption only. There is no evidence as to the prevalence or extent of lead absorption in Queensland children, so that one has not been supplied with the necessary data to assess the meaning and value of these signs in this connexion.

I have dealt with the question of the ingestion of paint and contend that, since the theory that this as a true cause still remains unproven, it cannot be allowed as a factor in diagnosis. That this fact has assumed disproportionate weight in the diagnosis is very evident from the following statement of Dr. Lockhart Gibson: "However, paralytic squint, choked discs or disc, available lead paint on verandah or garden railings which has become powdery from exposure or much more rarely fresh paint, in addition to the habit of biting the nails or sucking the fingers, may be the only evidence for plumbism we may be able to get."<sup>(3)</sup>

Attention must therefore be directed to the clinical evidence, since, in view of the foregoing, it is on this that the question has to be decided. It must be pointed out at once that the clinical evidence is very incomplete and unconvincing.

As Lockhart Gibson says:<sup>(3)</sup> "It cannot be too much again insisted on that the diagnosis of plumbism in some of these cases of ocular neuritis in children, has so little to indicate it, that parallelism with the cases which I have been able to prove as due to lead is often the main reason for a diagnosis."

Further, these cases only show in very rare instances any signs definitely recognizable as due to lead intoxication. Jefferis Turner states:<sup>(4)</sup> "It is a remarkable thing that children who suffer from ocular neuritis, do not suffer from limb palsy. I have never seen the conditions combined. Dr. Gibson has once observed wrist drop in a child suffering from ocular neuritis, and two or three cases in which the limb palsy had preceded or followed ocular neuritis at an interval of many months."

Also, in spite of the fact that lumbar puncture has been regularly performed in these cases, there is no record of any bacteriological examination of the cerebro-spinal fluid. Nor, apparently, has the blood been examined.

Further deficiency in the evidence is apparent when one remembers that, owing to the favourable course of the disease, no *post mortem* evidence has been obtainable.

To summarize, there is hardly any clinical evidence to correlate these causes to lead poisoning.

Some reference has been made to the question of lead in its causal relation to nephritis. I heartily agree with the opinion that this question bristles with difficulties. It is one, therefore, in which one must guard against assumptions and lack of clearness of thought. I am glad to note that your Queensland contributors agree with me that the question (No. 9570) which I was asked, contained a very ridiculous statement. I would also ask them to remember that a witness is required to answer the questions asked and to note that I did my best to defend Dr. Espie Dod's reputation when I stated that I did not believe that he had ever given utterance to such a nonsensical statement as the one attributed to him.

No one could seriously deny that lead intoxication may cause kidney disease. But such a statement does not carry one very far. One needs to consider the length of exposure, dosage and the exclusion of other causal influences. Morbidity statistics of a reliable character do not exist and a careful study of mortality rates, carried out with due regard to their fallacies, is an absolutely necessary piece of evidence before any opinion can be hazarded. The Technical Commission of Inquiry at Broken Hill, having recently completed an investigation of a very extensive character bearing upon this problem, feels that it has a valuable contribution to offer to the knowledge of this question. Bearing in mind the complexity of this problem, I do not propose to anticipate the results of this investigation now, since they will shortly be published elsewhere.

#### References.

- (1) THE MEDICAL JOURNAL OF AUSTRALIA, February 11, 1922, page 150.



(3) "Plumbic Neuritis," by J. Lockhart Gibson, *Transactions of the Intercolonial Medical Congress*, Adelaide, 1905, page 306.

(3) "On the Importance of Deionization in the Treatment of Plumbism in Queensland Children," by J. Lockhart Gibson, *THE MEDICAL JOURNAL OF AUSTRALIA*, April 5, 1919.

(4) "The Occurrence of Lead Poisoning Among Queensland Children," by A. Breinl and W. J. Young, *Annals of Tropical Medicine and Parasitology*, December, 1914, page 575.

(5) "The Importance of Lumbar Puncture in the Plumbic Ocular Neuritis of Children," by J. Lockhart Gibson, *Transactions of the Intercolonial Medical Congress*, Sydney, 1911, page 750.

(6) "On Lead Poisoning in Childhood," by A. Jefferis Turner, *Transactions of the Intercolonial Medical Congress*, Melbourne, Volume III., 1908, page 3.

(7) Osler's "Modern Medicine," 1907, Volume I., page 92. Yours, etc.,

S. A. SMITH.

149, Macquarie Street, Sydney,  
February 22, 1922.

SIR: The first suggestion of the cause of the lead poisoning among Queensland children was made by the late Dr. G. H. Hopkins in a discussion reported in the *Australasian Medical Gazette* in March, 1899. By a mistake in the references on page 152 of *THE MEDICAL JOURNAL OF AUSTRALIA* of February 11, 1922, it might appear that the suggestion came from me. I should be obliged if you will make this correction. Yours, etc.,

A. JEFFERIS TURNER.

February 15, 1922.

#### A PERSONAL MATTER.

SIR: The latest published "List of Members of the British Medical Association" and the last issue of *THE MEDICAL JOURNAL OF AUSTRALIA*, in reporting my contribution to the discussion on Dr. Poate's paper on "Bone Grafts," both credit me with a "M.C." decoration. This is an error. I was not awarded any decoration during the late war. I will ask you to kindly publish this correction. Yours, etc.,

D. J. GLISSAN.

151, Macquarie Street, Sydney,  
February 28, 1922.

#### VISIT TO THE CHEMICAL WORKS OF ELLIOTT BROTHERS, LIMITED.

WE have been asked to announce that Elliott Brothers, Limited, have issued invitations to the members of the New South Wales Branch and other Branches of the British Medical Association to inspect the firm's chemical works and laboratory at Balmain, Sydney, on March 14, 1922. Special trams will leave Circular Quay (outside the Customs House) at 2 p.m.. The visit should prove both instructive and interesting.

#### Medical Appointments.

DR. J. B. McELHONE (B.M.A.) has been appointed Government Medical Officer at Kempsey, New South Wales.

DR. F. O. STOKES (B.M.A.) has been appointed Deputy Licensing Magistrate of the Licensing Court for the Licensing District of Manning River, New South Wales.

THE appointments of Dr. E. ROBERTSON (B.M.A.) as Chairman and Member and of Dr. JANE S. GREIG (B.M.A.) as Member of the Midwives Board in Victoria have been notified.

#### Medical Appointments Vacant, etc..

FOR announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xviii.

DEPARTMENT OF PUBLIC INSTRUCTION: Vacancies in the School Medical Service.

#### Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmain United Friendly Societies' Dis- pensary Friendly Society Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phoenix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Pro- prietary, Limited Manchester Unity Independent Order of Oddfellows Mutual National Provident Club National Provident Association
QUEENSLAND: Hon- orary Secretary, B. M. A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Insti- tute Hampton District Hospital Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary, 3, North Terrace, Adelaide	Contract Practice Appointments at Ren- mark Contract Practice Appointments in South Australia
WESTERN AUS- TRALIA: Honorary Secretary, 6, Bank of New South Wales Chambers, St. George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVI- SION): Honorary Secretary, Wellin- gton	Friendly Society Lodges, Wellington, New Zealand

#### Diary for the Month.

- MAR. 14.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.  
MAR. 15.—Western Australian Branch, B.M.A.: Branch.  
MAR. 16.—Victorian Branch, B.M.A.: Council.  
MAR. 18.—Eastern District Medical Association, New South Wales.  
MAR. 22.—South Sydney Medical Association, New South Wales.  
MAR. 23.—Brisbane Hospital for Sick Children: Clinical Meeting.  
MAR. 24.—Queensland Branch, B.M.A.: Council.  
MAR. 28.—New South Wales Branch, B.M.A.: Council.  
MAR. 29.—Victorian Branch, B.M.A.: Council.  
MAR. 30.—South Australian Branch, B.M.A.: Branch.  
MAR. 31.—New South Wales Branch, B.M.A.: Annual Meeting.  
APR. 4.—New South Wales Branch, B.M.A.: Council.  
APR. 5.—Victorian Branch, B.M.A.: Branch.  
APR. 7.—Queensland Branch, B.M.A.: Branch.  
APR. 11.—New South Wales Branch, B.M.A.: Ethics Committee.  
APR. 12.—Western Australian Branch, B.M.A.: Council.  
APR. 12.—Melbourne Paediatric Society.

#### Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to *THE MEDICAL JOURNAL OF AUSTRALIA* alone, unless the contrary be stated.

All communications should be addressed to "The Editor," *THE MEDICAL JOURNAL OF AUSTRALIA*, B.M.A. Building, 30-34, Elizabeth Street, Sydney. (Telephone: B. 4635.)